JUNE 10, 1923

THE RUBBER AGE

VOL. XIII. NO. 5

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THE RUBBER AGE

The Only Twice-a-Month Rubber Publication

VOL. XIII. JUNE 10, 1923 No. 5

BUSINESS CONTINUES TO BE SATISFACTORY

Demand for Labor Indicates that Production in Tires, Footwear and Mechanical Lines Will Continue—Overproduction Not Expected

Although there is an apparent shortage of labor in rubber manufacturing centers, some executives are intimating that the rubber market may soon become saturated. Mr. Firestone in a recent address told a group of his employees that there would be no let up in the automotive industry this year. But he also said that "there is an overproduction of tires." John J. Watson, Jr., president of the Lee Tire and Rubber Co., however, states that there is no over-production of tires at present, but adds that there is "capacity for over-production."

On the other hand the *New York Journal of Commerce* states that "while there might be a slowing down by the large manufacturers, this was in all probability due to previously arranged plans to rush production in the first six months to meet orders and lay aside a reserve supply." Still, the Goodrich Rubber Company's plants at Akron are said to be at present turning out about 20,000 tires a day, its peak production having been reached in 1920, when more than 22,000 tires were made in a single working day. Finished inventories in Akron are said not to be excessive.

Mechanical Goods Sales Satisfactory

Reports coming from Akron and the New England states indicate that the mechanical goods, sundries and shoe sales continue on the up grade. As a matter of fact the mechanical rubber goods trade is experiencing one of the most prosperous periods in its history. Business promises to eclipse that enjoyed during the boom years. As reported in THE RUBBER AGE of April 25 the mechanical rubber goods manufacturers anticipate their most prosperous year in 1923. Railroad purchases are said to have stimulated the mechanical rubber goods business. As far as that part of the industry is concerned, manufacturers concede that 1923 will experience no let up in production.

In the rubber footwear line there has been a fairly constant demand for rubbers, rubber heels, rubber shoes and sneakers. Approximately $130,000,000 of this class of merchandise is expected to be disposed of this year. Orders for next winter's supply of rubbers and boots and overshoes have already been placed by some dealers. Manufacturers, as a result, state that there will be no let up in production in that phase of the industry. As yet, their reports indicate that their trade is "healthy."

Although executives of some of the larger plants are conceding a let up in production of tires, the smaller manufacturers are reporting that orders have been heavier than their production. This may be taken as an indication that the demand for tires by dealers and the consuming public has been fairly constant. In spite of recent assertions that there will be a seasonable let up in the production of tires, the labor department officials of the B. F. Goodrich Co. are reported as having stated that they are still facing a shortage of experienced rubber workers. The biggest demand is for experienced cord and fabric tire builders. Boot and shoe makers, engineers, mill men, truckers and sweepers are also needed. All factories in Akron continue their call for women workers for light work for all shifts. The biggest shortage is among skilled labor, but unskilled labor is also in demand. The unskilled workers frequently give up their jobs to chase phantom rumors of higher pay. As it is, the unskilled laborer in the rubber factory receives between $4 and $5 a day. All told Akron can use approximately 5,000 more men for factory and labor work.

One of the companies that is seeking both skilled and unskilled labor is at present producing tires above its normal capacity, and is turning out about 8,500 tires a day. This company, furthermore, has added a $325,000 addition to its plant. In all it is said that there is about a 3 per cent labor shortage in Akron of the total employment.

Foreign Trade Should Be Maintained

Of course over-production and an oversold market should be guarded against. Julius Klein, Director, Bureau of Foreign and Domestic Commerce, recently said in a statement: "If the United States is to level out the valleys of periodic depression in the curve of its business cycles and is to keep its factories and farms steadily and fully occupied, the maintenance of permanent foreign outlets must be assured regardless of fluctuations in domestic market conditions. It does not improve the standing of America's business abroad to have the first sign of better domestic trade bring about the immediate abandonment of all interest in those foreign contracts which had been hailed with such joy and solicitous regard during the dark days of 1921."

In the foreign field American rubber manufacturers have to meet the competition of Michelin, Dunlop, Pirelli and other concerns. These organizations are endeavoring to wrest whatever part of the rubber trade they can away from the American rubber manufacturer. To date the leading foreign consumer of America's rubber goods is South America. Prices of late have been showing a stiffening tendency there.

The great problem in the rubber industry is to determine a safe level of production, to adhere closely to the manufacture of articles for which there is a market. To create a market for one's products, Alvin E. Dood claims, "is first cousin to speculation, and speculation is the bane of business."

NEW USE FOR RUBBER

The Mayor of Indianapolis recently suggested that pillars guarding the safety zones in the streets of that city be made of rubber. The Mayor thinks that old automobile casings, or possibly inner tubes, would make the ideal safety zone pillar. He reasons in this manner: When a speeder 'smacks' into a rubber pillar his car will just *bounce off*. But the *Indianapolis News* thinks that should a motor vehicle hit one of those rubber pillars the motor might bounce back a long way and smash everything behind it. "To every action there is an opposite and equal reaction."

Wage Increases Posted

The National India Rubber Company of Providence, R. I., and the Convers Rubber Company of Malden, Mass., recently announced wage increases of 5 per cent to all employees, effective May 21. The Boston Rubber Company, employing 1,200 workers, in Malden, also announced a wage increase, effective June 4.

MELLON INSTITUTE'S TENTH ANNUAL REPORT IS ISSUED

The Mellon Institute of Industrial Research, University of Pittsburg, has issued its tenth annual report covering the industrial fellowships of the institute. An industrial fellowship utilizes the services of one research chemist or engineer (with assistants when necessary), who is responsible directly to the executive staff of the institute. A multiple industrial fellowship has the services of one or more research men.

The renewal of a certain portion of the fellowships each year enables the encumbents to become thoroughly informed in their particular fields. A course of lectures, therefore, is given throughout the year. On February 12 and 23 H. W. Greider delivered two lectures on "Chemistry in the Rubber Industry."

One of the adavntages of industrial research in a central laboratory is that it enables a small manufacturer, who cannot afford a research laboratory, to profit from the investigation in the same way as a larger manufacturer. Officers of administration are: Andrew W. Mellon, Richard B. Mellon and John G. Bowman, while Edward R. Weidlein is director of the institute.

Opens New York Office

Announcement has been made by the Wishnick-Tumpeer Chemical Co., Chicago, Ill., that a branch office has been established at the Bush Building, 130 West 42nd Street, New York City, while warehouse facilities have been arranged for at the Bush Terminal, Brooklyn.

It is the intention of the Wishnick-Tumpeer Chemical Co. to cater to the consuming trade in the eastern territory along the same merchandising lines they have successfully adopted in their Cleveland and Chicago offices. Ample stocks will be carried to meet the requirements of the trade. Henry H. Stiller will be in charge of the New York office.

Mason Buys Machinery

On account of the installation of new machinery in the tire building and finishing departments, the plants of The Mason Tire and Rubber Co., Kent, O., have practically been closed during the week of May 28 to June 4. Officials of the company state that there is no let up in production now that work is resumed. Production has been increasing during the past two weeks, it is said. Installation of the new machinery will make possible greater production without more floor space.

Receiver For Tire Companies

A receiver has been appointed for the Beacon Tire Co., and the Automobile Tire Company of Beacon, N. Y. A claim for $9,500 by De Mattia Bros. is said to have forced the rubber companies into receivership. Assets of the Beacon Tire Co. are said to be about $400,000, while liabilities are placed at $128,367. David Costuma has been appointed the receiver.

IS THE HORSE DISAPPEARING?

Despite the ever-increasing use of automotive vehicles, as evidenced by the larger daily production of automobiles and tires, the horse-drawn vehicle is far from obsolete.

Figures issued by Goodyear show that their business for the first few months of this year showed carriage tire sales which exceeded all expectations. In Ohio for instance, the registration of horses was greater than that of automobiles—900,000 horses and 858,716 cars in 1922.

Many sections of the country, especially in outlying districts still rely on buggies, phaetons and carriages of various sorts for transportation. Charleston and St. Augustine still boast horse drawn "taxis" and even modern New York and Brooklyn rely on this method of transportation for no small means of their travel.

GUNN RESIGNS AS HEAD OF U. S. TIRE COMPANY

NEW YORK, June 8.—C. B. Seger, president of the United States Rubber Company, authorizes the following statement:

J. N. Gunn resigned today, both as vice president of the United States Rubber Company and president of the United States Tire Company.

C. B. Seger, president of the United States Rubber Company, will assume direct charge of all activities of the tire division of the company, and will be elected president of the United States Tire Company.

C. J. Butler, second vice president, will have general charge of all manufacturing activities, and G. S. Shugart, second vice president, will have general charge of all sale activities of the tire divison, as heretofore, both reporting, however, directly to the president.

Mr. Gunn has not yet announced his new plans.

Tire Market in Bahia, Brazil

There are 400 automobiles in Bahia. Michelin holds second place in the tire market, there being only three other makes (all American) in stock at present. The Michelin agent, Antonio Navarro Lucas, Rua dos Algibebes, gives 10 per cent discounts to consumers.

Tire Trade Competition in Madras

The same retail price lists are in effect in both Madras and Calcutta. Michelin and one American company practically divide honors for first position here, and another American company is running a close contest with Dunlop for the next positions. Continental, Avon and another American tire are also fairly prominent in the market. The native tire dealers (retailers) generally will give as much as 25 per cent off the listed retail prices.

SAFETY COUNCIL TO MEET IN DETROIT ON JUNE 12

The Engineering Section of the National Safety Council will hold its second meeting of the year at Detroit, Mich., in cooperation with the Detroit Safety Council on June 12.

During the morning the subject of safety in welding and cutting will be discussed by experts representing the three modern methods: electric, gas and thermit, followed by a practical demonstration of the use of goggles to protect against the injurious visible and invisible rays. A general discussion will follow.

The afternoon will be devoted to the general topic of industrial sanitation and health work, with particular reference to the prevention of infections from the use of cutting oils.

Arthur H. Young, Manager of Industrial Relations for the International Harvester Company and last year's president of the National Safety Council will talk at the banquet meeting on Safety Work That Pays Dividends. At the same meeting Judge Alva R. Corlett, Cleveland traffic court magistrate, will tell of his experience in Preventing Street Accidents by Law Enforcement. This is the last conference of the safety engineers before the Twelfth National Safety Congress of the National Safety Council at Buffalo Oct. 1 to 5.

Continental To Build

The Continental Rubber Works Co. plans to build an addition to its plant in Erie, Pa. The new plant will be three stories high of reinforced concrete and will occupy the northwest corner of Twentieth and Liberty streets. The addition will cost about $55,000.

Start Rubber Packing Co.

Another addition to the rubber packing industry will be operating shortly. The new company is The Palmyra Packing Co., Palmyra, N. Y. All local men are backing the new organization, the most prominent of whom are: J. N. Todd, F. W. Coates, Charles Mc Louth and Samuel Hunt. For several years Mr. Todd has been sales manager of the Garlock Packing Co., while Mr. Coates has been an official of the Crandall Packing Co. for many years.

Visit Hartford Rubber Plant

The Connecticut Society of Civil Engineers recently met in Hartford, where they visited the Hartford Rubber Works plant. After going through the plant the society listened to a talk on "The Motor Vehicle and Its Relation to the State Highway."

Republic Sales Satisfactory

The Republic Rubber Co. sales for January and February were 50 per cent in excess of sales for the same period last year, states C. H. Booth, directing the properties. Gross business for 1923 is estimated at from $10,000,000 to $12,000,000.

APRIL RUBBER EXPORTS NEAR $4,000,000 MARK

Figures for April Slightly Smaller than March, They Are Larger Than in Any Other Month Since 1920—Willingness to Sell at Competitive Prices Responsible

With a total value of $3,702,748 exports of rubber manufactures from the United States in April, though $613,428 less than in March, were far above any other month since the 1920 boom period. In April, 1922, the value of exports was only $2,823,099. Exports during the first four months of this year have followed the same trend as during the first four months of 1922. With a similar tendency for the remaining months of the year, the 1923 shipments would easily surpass $40,000,000, as compared with $33,450,832 in 1922. The single factor most responsible for this increasing trade according to the Rubber Division of the Department of Commerce is the apparent ability and willingness of American tire exporters to sell at competitive prices in every foreign market. At approximately equal prices the recognized high quality of American products will assure their increasing sale abroad.

The unit value of automobile casings exported in April set a new low record of $10.28, compared with $10.59 in March; the unit value of inner tubes dropped from $1.65 to $1.56. Canvas rubber-soled shoes were valued at 72 cents per pair, as compared with 75 cents in March; rubber packing at 45 cents per pound, as compared with 51 cents in March; and rubber thread at 98 cents as compared with $1.08. Solid tires for motor trucks, rubber soles and heels, rubber hose, and druggists' rubber sundries showed no significant price variations, but the value per pair of rubber boots increased from $2.97 in March to $3.16 in April; rubbers from $0.82 to $1.02 and rubber belting from 50 cents to 58 cents per pound. (For price variations during 1922 see Commerce Reports, May 15, p. 427.) While export prices depend on many variable factors, it may safely be stated that tire prices in all export markets are now at record low levels with no visible sign of upward revision by leading competitors. The only evidences of price increases in other products are to be noted in the unit value of exports of rubber boots, rubbers, and belting.

Tapping a Rubber Tree on Broadway

In a remarkable window display, a scene on its great rubber plantation in Sumatra is reproduced in one of the windows of its main offices at 1790 Broadway, New York City, by the United States Rubber Company. A Javanese worker has just tapped a rubber tree and real liquid rubber drips into the cup.

Salem Proposes To Build

The directors of the Salem Rubber Co., Salem, O., are contemplating the addition of a new building to their plant. Business during the past year has shown about 60 per cent increase, and it is said that a new building as well as new equipment will be necessary to double its capacity. At present the company is turning out about 325 tires a day.

Motor Vehicles in the Philippines

During 1922 there were 1,865 new motor vehicles registered and 11,476 re-registered, or a total of 13,341 as compared with 13,493 registered in 1921. Of the 1,917 motor vehicles previously registered which were withdrawn from operation, 88 were reported unserviceable. Including renewals, 16,859 drivers were licensed to operate motor vehicles. The Benguet automobile line operated during the year 11 touring cars, 6 passenger trucks, and 6 freight trucks.

New Bills For Filipinos

As intimated in a news item in THE RUBBER AGE of May 25 a special session of the Philippine Legislature has been called by Governor General Leonard Wood. The Legislature will convene sometime this month and bills will be introduced to liberalize the shipping, forestry and mining laws to attract outside capital. The forestry bill provides for leasing of tracts to corporations which would enter the rubber industry.

City Council Buys Fire Hose

The city council, Des Moines, Iowa, recently purchased 6,000 feet of fire hose at an average cost of about $1.35 a foot. The United States Rubber Co. got one contract for 1,500 feet of Keystone Hose at an average price of $1.40 a foot, while the O'Dea Hardware Company received the same award for Keystone Hose at the same price. The largest award was made to the Gutta Percha and Rubber Co. for 3,000 feet of Baker fabric hose at $1.30 a foot.

Receiver For Hawkeye Tire

A temporary receiver was appointed for the Hawkeye Tire and Rubber Co., Des Moines, Iowa, upon a petition filed in a United States District Court by A. J. and C. Anderson of Warren County, Iowa. Petitioners who own 144 shares of stock allege that the company has made false statements regarding its business. In addition the petitioners ask for an injunction restraining the company from removing from the state. The company is capitalized at $3,500,000.

$100,000 Fire at N. J. Plant

The new building of the New Jersey Chemical and Rubber Company, Hillside, N. J., was recently destroyed by fire. The damage to the building, machinery and stock is estimated at $100,000. The fire was discovered by the night watchman in the basement near the boiler room. The factory was a three story brick and concrete building.

Lincoln Sells Plant

All of the equipment and the factory of the Lincoln Highway Tire Co., Fulton, Ill., was recently sold. The holders of two promissory notes totaling $43,000 are said to have foreclosed on the property.

Seiberling to Expand

The New Castle plant of the Seiberling Rubber Co. is expected to increase its capacity to 3,000 cord tires a day and 6,000 tubes. Output at present is between 700 and 800 cord tires a day and 1,500 tubes.

RUBBER ASSOCIATION ACTIVE DURING MAY

Meetings With Representatives of Express Companies Result in New Rules for Tire Wrapping and Marking—Plans for National Advertising Campaign Being Formulated

The regular monthly meeting of the Traffic Committee of the Rubber Association was held at the Yale Club, New York on May 15th. A number of important subjects were considered, among which was the marking of automobile tires for shipment by express. Under the present rules of the Express Company, if two addressed tags are used in marking tires, one tag must be concealed beneath a strip of burlap or cloth tightly bound around the package. This rule was issued to reduce the number of claims presented by shippers for the loss of tires in transit, because of the loss of tags from the tires. The Traffic Committee of the Association discussed the subject with a representative of the Express Company after the meeting, and expressed the opinion that if a concealed tag is necessary, the tire manufacturers should be permitted to insert that tag between the folds of the paper wrapping. The Express Company's representative accepted this proposal, and Express Classification No. 28, to be issued shortly, will contain that requirement.

The elimination of the use of burlap will mean considerable saving to the manufacturers in the cost of that material and will reduce the labor involved in tagging tires.

* * *

The Freight Container Bureau of the American Railway Association has issued tentative new specifications for fiber containers for boots and shoes for criticism by footwear manufacturers. A Sub-Committee of the Traffic Committee, composed of representatives of rubber boot and shoe producers, met with a representative of the Bureau on May 14th, to co-operate in the establishment of specifications which will reflect the needs of the rubber footwear manufacturers.

* * *

The Bureau of Explosives of the American Railway Association recently notified the Rubber Association that it was investigating the use of certain accelerators in tire manufacture, the thought being that the fumes from tires containing aniline oil had damaged other freight. The subject received the joint attention of the Traffic Committee and a committee of rubber research chemists, and a conference was held on May 16th between those bodies and representatives of the Bureau of Explosives. The latter considered the facts presented by the Rubber Association and concluded that the damage complained of was not attributable to contact with tires.

* * *

The contemplated national advertising campaign to educate tire users concerning the Manufacturers' Standard Tire Warranty was one of the important subjects discussed at the meetings of the Executive Committee—Tire Manufacturers Division held on April 25th and May 23rd. The Rubber Association is proceeding with the details of the campaign, the cost of which will be borne by subscriptions from individual manufacturers. The Solid Tire Committee of the Tire Division met on May 23rd following the meeting of the Tire Executive Committee.

* * *

On May 3rd the Service Managers Committee of the Tire Division gave its final approval to the pamphlet on "The Care of Pneumatic Tires" which is to be distributed by the Association and by individual manufacturers to tire dealers and car owners throughout the United States. The pamphlet is now being printed and the initial supply will doubtless be available about the first of July.

* * *

The Industrial Relations Committee met on May 11th and discussed problems relating to labor conditions. The Association office recently distributed to members, copies of an advance report by the National Industrial Conference Board on its recent labor supply survey, which should be of interest to all rubber manufacturers in view of the increasing attention paid to labor conditions by industry in general.

* * *

The Automobile Fabric Manufacturers Division of the Association met in New York on May 14th and discussed questions relating to that trade.

Tire Price Increases in Germany

Fabric nonskid tires in Germany are commonly steel studded. Prices are changing rapidly. The tire manufacturers have a price combination and prices for the leading makes (Continental, Peters Union, Excelsior, Calmon, Dunlop, Harburg-Wien) are practically uniform. During the past three months prices in paper marks have increased about 160 per cent; in dollars the advance is about 26 per cent. It costs 292,500 marks ($13.84) to buy a Continental clincher cord, size 30 x 3½.

American Rubber in Canada

American concerns control 16 of the 32 rubber plants now operating in Canada. Total capital invested amounts to about $42,787,584. The leading companies in the Canadian field are Goodyear Tire and Rubber Co., Firestone Tire and Rubber Co., Dunlop Tire and Rubber Goods Co., and the Canadian Consolidated Rubber Co.

RUBBER IS NOT RUBBER ACCORDING TO BARRETT

Accused of unfair methods of competition by the Federal Trade Commission, the Barrett Company of New York at a recent hearing, held before that body, admits that the word "rubber" is a character or term that sometimes is used in connection with asphalt roofing. The company, however, denies using the word "rubber" as a description of roofing material in an endeavor to create the impression that that material was made in whole or in part from rubber.

The Federal Trade Commission avers that the company had used the word "rubber" in labels, advertising and other printed matter describing felt base roofing matter sold by it. The complaint before the commission alleges that for two years the company has been using the misleading word "rubber". This, it is said, created a false and misleading impression throughout the trade. The public, it is said, accepted the fact that the Barret company was manufacturing roofing material wholly or in part made of rubber.

The company's answer cites various court and other records to show that the word "rubber" and words coined therefrom have been in common use in the trade for many years to designate asphalt roofing materials of a certain class, without reference to the ingredients. It also agrees to submit either to using the word "rubber" only in quotation marks or to abandon its use entirely in connection with non-rubber roofing material, provided other manufacturers are also required to do the same.

Added Warehouses for K-T

Calvin Stitt, General Sales Manager for the Krippendorf-Tuttle White Cliffs Products Company, has just returned from an extended business trip through the Middle West, Eastern and New England States.

Warehousing facilities have been made and stock of K-T products is being carried in Boston and New York to take care of any emergency shipments. The company works are now nearly on a capacity production basis.

Hartford Dealers Organize

The tire dealers of Hartford, Conn., have formed the Hartford Tire Dealers Association, of which Charles W. Helm is president; Joseph Kennedy, vice-president; Hughie O'Brien, treasurer, and Albert Wurts, secretary. A newspaper advertising campaign is being conducted by the association, the idea being to educate the public to purchase from reputable dealers.

Shipments of Rubber Manufactures from the United States to Non-Contiguous Territories During the Month of March 1923

		ALASKA		HAWAII		PORTO RICO	
		Quantity	*Dollars*	*Quantity*	*Dollars*	*Quantity*	*Dollars*
Boots and Shoes	(Pairs)	7,516	15,956	5,999	7,519	40,001	28,971
Druggists' rubber sundries	(Pounds)	358	402	1,486	1,406	3,278	1,592
Automobile tires	(Number)	157	1,493	12,848	105,673	9,096	62,311
Other tires	(Number)	28	80	971	5,439	170	322
Belting hose and packing	(Pounds)	21,508	12,730	29,022	13,039	7,365	2,593
Other rubber manufactures	(Pounds)	1,389	975	13,772	9,129	8,109	3,278
Coated and water-proofed goods	(Pounds)	9,837	5,740	4,654	2,563	3,266	2,711

DOMINION'S MECHANICALS TAKEN OVER BY DARCOID

A separate company to be known as The Darcoid Company, Inc., has been formed to take over the manufacture and distribution of the packings, mechanical rubber goods, and miscellaneous asbestos and rubber products of the Dominion Asbestos & Rubber Corporation. The Dominion Asbestos & Rubber Corporation will confine its activities to the manufacture and distribution of Dominion Brake Lining and the New Dominion Shock Absorber.

Wm. M. Meek, president of the Dominion Asbestos & Rubber Corporation is president and treasurer of the Darcoid Company. Wm. F. McClean formerly of the Gutta Percha & Rubber Mfg. Co., is vice-president, and M. Rueger formerly of the Dominion Asbestos & Rubber Corporation is secretary.

The Dominion Asbestos & Rubber Corporation has for some time been limiting its sales effort to the automotive lines but the new company is planning to increase its sales force and make an aggressive drive for packing business, both automotive and industrial.

Faultless Rubber Expands

The Faultless Rubber Co., located near Ashland, Ohio, contemplates erecting two new buildings, one being an acid storage house, 15 x 103 feet, the other being a crude rubber storage building, 45 x 136 feet. Heavy machinery, including washers and mills, will be installed in the rubber house. The company is employing about 500 workers at present, and manufactures rubber sundries and surgical goods.

Kelly Announces Changes

W. H. Bell has recently been appointed sales manager in charge of branches and organization by the Kelly-Springfield Tire Co., while T. S. Lindsey becomes sales manager in charge of branch and manufacturers' sales. R. H. Hurd, formerly assistant advertising manager, becomes advertising manager with E. E. Hill as assistant. John V. Mowe, formerly vice-president, director and sales manager, has resigned owing to ill-health. Maurice Switzer, vice-president, will continue to supervise sales and advertising.

Kleinert Moves Uptown

Announcement has been made by J. B. Kleinert Rubber Co. that they have moved into their new quarters at 485 Fifth Avenue, New York City. For the past 27 years this company has been located at Broadway and Waverly Place. This firm deals in baby pants, bathing caps, household aprons, sanitary goods and other well known lines.

Pennnsylvania Leases Building

The Pennsylvania Rubber Co. has recently completed the terms for a 10 year lease for the ground floor and basement of a four story building, 197 E. Gay Street, Columbus, O. The lease became effective June 1, and the annual rental is $7,200 a year. The storeroom just leased has a frontage of 67 feet on Gay Street with a depth in Young Street of 142 feet. The site is considered one of the best in Columbus.

H. N. Whitford

Recently Appointed Chief of Crude Rubber Section, Rubber Division of Dept. of Commerce

Blandin Gets Appointment

The Department of Commerce announces the appointment of J. J. Blandin, Baltimore, Maryland, formerly head of the Rubber Plantations Department of the Goodyear Tire and Rubber Company, as Assistant Chief of the Section which will conduct the crude rubber survey now being undertaken. With H. N. Whitford, Chief of the Section, Mr. Blandin will take an active part in the organization and direction of investigating parties, and will assist in the general administrative work in Washington.

Mr. Blandin has acted as the rubber plantation authority for Goodyear for a number of years, six of which were spent on the company's plantation in the Far East. He has been with the Goodyear Company since 1911.

Huntington Branch For Fisk

The Fisk Tire and Rubber Co. has announced the opening of a wholesale branch in Huntington, W. Va. The states of West Virginia, Kentucky and Ohio will be covered from the new branch. C. M. Peterson, who has covered this territory for the last seven years for Fisk, will be in charge of the district office. At present, it is said, Fisk has more than 200 authorized dealers in the tri-state territory. Mr. Peterson predicts that the local station will do more than $200,000 in business in the fiscal year closing next November.

CRUDE RUBBER COMMITTEE PLANS WORK FOR FALL

A meeting of the Crude Rubber Committee of the Rubber Division, American Chemical Society, was held at the Chemists' Club in New York City, May 8, 1923. All the active members were present and the work of the committee was planned and organized.

As a compound test for variation of rate of cure, the pure-gum stock—100 rubber and 10 sulphur—was adopted. For the evaluation of quality a formula containing 3 per cent sulphur, 30 per cent zinc oxide to 100 of rubber, and accelerated with "hex," was tentatively decided upon.

Mr. Rose will take up the development of a breakdown and a swelling test. Mr. Van Valkenburgh will work on viscosity determinations, and determine the value of the zinc-oxide "hex" stock for test purposes. Mr. Sanderson will investigate the matter of selecting the most significant physical measurements for cure criteria, using the pure-gum test formula. Mr. Cranor will undertake to determine the relation between variation of different lots as shown in the pure gum mix, compared with the action of the same rubbers in certain practical accelerated mixings. The committee expects to have a definite report for the fall meeting of the Chemical Society.

N.T.D.A. Board Meeting

The Board of Directors of the National Tire Dealers' Association will hold its Semi-Annual Meeting in Chicago, on Tuesday, June 19, at which time the convention city for 1923 will be decided upon. Also, other matters of great importance will be taken up at this meeting; i.e., business conditions of dealers, and the accomplishments of the National Association since the last convention.

Demand Still Maintained

Current reports of overproduction which may necessitate the closing down of many rubber plants in the Ohio district within 30 days are regarded as exaggerated. The consensus of opinion seems to be that when the demand lessens in the next two months production schedules will be cut from 10 to 25 per cent which is the customary practise when seasonal slowdowns occur. This lessening of demand will not be caused by a decrease in consumer buying but will be caused by the dropping off of original equipment business on the part of automobile manufacturers. Manufacturers have about two months supply of finished product on hand.

War Claims Filed

Ohio companies have recently filed $2,700,000 in claims against Germany with the Mixed Claims Commission, according to Robert C. Morris the American agent. The claim presented by the Goodyear Tire and Rubber Co. is the largest of those in Ohio, aggregating $1,250,000. The Miller Rubber Co. claims losses in Germany during the World War of $97,779.

LEE TIRE GETS REPUBLIC RUBBER FOR 65,000 SHARES

NEW YORK, June 6—Stockholders of the Lee Tire and Rubber Co. ratified today the recent action of the directors and voted to increase the capital stock by 150,000 shares, 65,000 shares of which will be issued as payment for the purchase of The Republic Rubber Company of Youngstown, Ohio. The remaining 85,000 shares will go into the treasury of the company.

John J. Watson, Jr., president of the Lee Tire and Rubber Co., in making this announcement said that both Lee and Republic Rubber Companies will have no outstanding bonds or preferred stock. The issuance of the 65,000 shares of capital stock completes the transaction through which Lee Tire and Rubber Co. acquires complete control of the Republic Rubber Co.

Plants of the Lee Tire and Rubber Co. are operating at capacity, Mr. Watson said, while the Republic Rubber Company's plants are turning out about 1,200 casings a day. Mr. Watson said that a consolidated financial statement would be issued shortly.

Pequannock's Plant Not Damaged by Fire

THE RUBBER AGE wishes to correct a statement published in its issue of May 25 regarding The Pequannock Rubber Co. The company's main plant in Bulter, N. J., was not damaged by fire on May 6 as may have been inferred. The building where the fire occurred is 1,000 feet east of the company's main plant, and is a small building. The company also advises us that this is the first fire, and not the third, that occurred in that building. The company is continuing operations as usual.

National Increases Wages

Announcement was made by the factory council committee of National Rubber Co., Bristol, R. I., that wages would be increased 5 per cent. The last wage change was made in January. Since then a request for an additional increase has been under consideration since the latter part of April. Work at the factory is now reaching its slack season and a five-day schedule is expected to be put into effect shortly. The wire division, however, will continue to work full time.

Rotary Plant in Operation

The Rotary rubber plant at Licking View near Zanesville, which was recently purchased from the Franklin Mortgage Co. of Columbus, by the Hubbell Rubber Co. for $80,000 is now operating again and tires are being turned out daily.

The Rotary plant resumed operations several days ago in a small way and has already increased the working force to 18 men. More men are being given work every day and it is thought that the number employed will be doubled shortly.

The new owners of the plant are Messrs. Hubbell, Dilts and Donaldson, all of Greensburg, Pa. All are experienced men in the rubber business, Mr. Hubbell being particularly qualified in the production end, while Messrs. Dilts and Donaldson are experienced in the sales end of the business.

While only about 18 or 20 men are now employed, it is planned to increase this number to 75 within the next month or two.

Mid-West Meeting on June 12

The next meeting of the Mid-West Rubber Manufeturers' Association will be held on June 12 at the Hotel La Salle, Chicago. The Board of Directors meeting will take place at 10 A. M. followed by a luncheon at noon. It is planned to have H. S. Firestone address the meeting.

Star's Production Mounts

The Star Rubber Co., Akron, Ohio, is operating close to peak capacity, having sufficient orders on its books to keep plants on this basis for some time to come. Current operations are said to be 50 per cent in excess of the rate maintained last year.

HOOD SHOWS $3,000,000 INCREASE OVER 1922

For the year ended March 31, 1923 the Hood Rubber Co., Watertown, Mass., showed gross sales of $28,180,007, compared with gross sales of $25,239,603 for the fiscal period in 1922. Net profits avaliable for common dividends were equivalent to $12.89 a share. The consolidated balance sheet showed current assets, as of March 31, 1923, of $14,929,580, against current liabilities of $1,537,616, leaving a net working capital of $13,391,964, contrasted with a net working capital of $12,323,970 at the close of the previous year. The ratio of quick assets to quick liabilities were 9.71, compared with 3.74 at the close of the 1922 fiscal year. Notes payable were reduced from $3,585,000 to $500,000 during the year.

A Bibliography of Colloid Chemistry

A colloid bibliography in mimeographed form has just been issued by The National Research Council, Washington, D. C. This edition on the Chemistry of Colloids contains 1,800 references, covering 106 topics. References are classified and accompanied by brief comment.

Among the classified groups are: Asphalt Bicolloids, Capillary Analysis, Casein, Cellulose and Cellulose Esters, Cements, Clays and Soils, Coagulation, Dialysis, Emulsions, Filteration, Foam, Gels, Gelatin, Gums, Hydration, Lubricants, Peptization, Petroleum, Protein Swelling, Rubber, Silver, Soap, Sulfides, Surface Tension, Tanning, Ultramicroscope, Viscosity and Water Proofing.

Meyers Ready To Start

The Meyers Rubber Production Co., Lorain,O., is about ready to start production. The company has a large brick building on E. 28th Street, and at the start will employ about 50 men. Directors of the company are: R. P. Meyers, John Zoller and R. R. Jones. The company is incorporated for $50,000.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

January, 1922 to April, 1923

"Production" and Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

(Compiled by The Rubber Association of America, Inc.)

	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
MONTH	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
January, 1922	66	4,174,216	2,055,134	1,596,806	66	5,246,647	2,343,393	1,889,724	11	181,769	40,224	33,294
February, 1922	66	4,691,329	2,084,308	1,562,365	65	6,141,956	2,596,774	1,702,583	11	183,448	39,492	36,805
March, 1922	63	5,183,286	2,645,790	2,073,963	63	6,991,118	3,017,511	2,090,737	11	182,197	49,433	48,350
April, 1922	65	5,464,336	2,401,187	2,086,651	65	7,230,096	2,650,573	2,329,343	11	173,748	46,664	52,309
May, 1922	65	5,523,095	2,721,503	2,639,273	65	7,189,552	2,970,696	2,938,947	11	170,904	57,640	60,711
June, 1922	64	5,042,147	2,838,890	3,133,260	64	6,186,534	3,130,629	3,973,679	11	169,808	66,089	63,408
July, 1922	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August, 1922	63	4,629,392	2,905,209	3,029,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September, 1922	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797
October, 1922	64	4,682,958	2,674,662	2,588,770	64	5,488,033	3,787,758	3,420,680	11	213,942	85,480	71,275
November, 1922	62	4,964,976	2,783,134	2,379,708	61	6,210,053	3,850,908	3,075,023	11	234,684	85,775	61,466
December, 1922	59	4,599,208	2,656,942	2,934,079	59	5,732,125	3,411,074	3,825,949	10	244,061	77,221	64,570
January, 1923	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,383	60,611
February, 1923	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March, 1923	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April, 1923	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	11	260,631	71,468	72,609

STATISTICS

IMPORT **PRODUCTION** **EXPORT**

American Made Tires Dominant in Curacao

There is only one European tire (Continental) on the market and American tires are in favor here. Representative prices are as follows: 30 x 3½ clinchers, fabric 30 to 32 florins, cord 36 to 40 florins; straightside 32 x 4 fabric 45 to 50 florins, 32 x 4 cord 58 to 60 florins 32 x 4½ cord 77 to 73 florins.

Shipments of Rubber Manufactures from the United States to Non-Contiguous Territories During the Month of April, 1923

	Alaska		Hawaii		Porto Rico	
	Quantity	*Dollars*	*Quantity*	*Dollars*	*Quantity*	*Dollars*
Boots and Shoes ..... (Pairs)	10,611	30,558	7,572	7,831	39,368	26,841
Druggists' rubber sundries (Pounds)	1,100	1,004	2,024	2,615	1,352	1,202
Automobile tires ..... (Number)	90	1,374	13,260	62,573	4,525	46,006
Other tires ..... (Number)	—	—	1,702	14,941	563	11,047
Belting, hose and packing (Pounds)	26,311	13,798	27,569	10,803	15,461	6,019
Other rubber manufactures (Pounds)	463	363	32,383	25,668	24,683	11,779
Coated and waterproofed goods (Pounds)	13,541	8,252	4,928	3,420	4,900	2,674

Handbooks on Canada and the Philippine Islands

The Rubber Division has recently issued outline monographs giving facts affecting the importation of rubber products into Canada and the Philippine Islands. The Canadian market, which is supplied chiefly by local manufacturers who have the advantage of a very high tariff protection, is nevertheless an important market to United States exporters of rubber goods. The rubber goods trade in the Philippines is practically monopolized by United States manufacturers, Japan being the only foreign country securing any appreciable share of the trade. Copies of the handbooks are available, free of charge, to exporters of rubber products who are listed on the Exporters' Index.

Tire Market in Kalgan, Manchuria

Active competition from the Japanese Dunlop has caused considerable price reduction. An American house (S. L. Wooden & Co.) is agent for Dunlop, but although the firm is supposed to have an exclusive agency, Chinese firms in the district are able to undersell the agent. The market is good and all that is needed to meet the Dunlop prices. (Consul Samuel Sobokin, Kalgan, April 1.)

New Tire Stocks in Angola

A new dealer has entered the tire market and a new stock of tires will shortly be placed on sale. Other dealers have made, or are about to make, importations, and price fluctuations are anticipated. Price changes during the past three months have been unimportant.

Domestic Exports of Reclaimed, Scrap and Old Rubber, from the United States by Countries, for Month of April, 1923

	RECLAIMED		SCRAP AND OLD	
Countries	*Pounds*	*Dollars*	*Pounds*	*Dollars*
France	25	10	121,093	7,866
Germany	—	—	110,081	6,639
Spain	—	—	312,341	21,933
England	26,404	3,146	41,540	3,439
Scotland	—	—	111,267	5,398
Quebec and Ontario ..	501,916	45,755	665,672	18,315
British Honduras	18	7	—	—
Mexico	10,20	153	—	—
Japan	12,710	701	139,159	2,072
Total	542,093	49,772	1,501,153	65,662

Tire Stocks Normal in South Africa

The big overstocks of tires dealers were carrying last year have been largely absorbed and it is doubtful if there are any serious overstocks in South Africa. At present prices, speculators and agents who did much to disrupt the market last year can only compete with difficulty. Attempts on the part of manufacturers' branches to come to an agreement regarding stabilization of prices have failed. It is likely, however, that agreements to eliminate trade abuses and to govern general sales policies might be reached.

Many new garages and retail tire dealers have opened within the last few months, the principal reasons being the small capital necessary to start such a business, as the manufacturer's branches put in stock for the retailer on consignment as many tires as are needed. Some of the American manufacturers held out for a long time agianst this practice, but it is said they have all now come to it. Michelin led in the February price reduction and was followed by some American firms. Dunlop prices are still unchanged.

Summary of Rubber Exports for April, 1923

Compiled by the Department of Commerce

RUBBER BELTING, HOSE, PACKING, AND THREAD.

	Rubber Belting		Rubber Hose		Rubber Packing		Rubber Thread	
	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Total	230,305	133,234	319,257	124,256	139,508	62,847	130,295	127,578

PNEUMATIC CASINGS AND SOLID TIRES.

	Pneumatic Casings				Solid Tires			
	For automobiles		Other		Automobiles		Other	
	Number	Dollars	Number	Dollars	Number	Dollars	Pounds	Dollars
Total	166,865	1,714,702	4,937	18,986	4,651	4,695	79,646	20,351

RUBBER FOOTWEAR AND SOLES AND HEELS.

	Boots		Shoes		Canvas shoes with rubber soles		Rubber soles and heels	
	Pairs	Dollars	Pairs	Dollars	Pairs	Dollars	Pounds	Dollars
Total	23,340	73,742	49,172	50,293	465,198	333,521	169,282	60,945

HARD RUBBER GOODS AND DRUGGISTS' RUBBER SUNDRIES.

	Druggists' Rubber Sundries		Battery jars and Accessories		Other Electrical Supplies		Other hard rubber goods	
	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars	Pounds	Dollars
Total	74,644	67,983	86,506	21,735	24,144	11,147	66,782	48,619

PNEUMATIC TUBES, REPAIR MATERIAL, MANUFACTURES OF RUBBER NOT ELSEWHERE SPECIFIED

	Pneumatic Tubes				Tire Repair Material		Rubber Manufactures	
	Automobiles		Other					
	Number	Dollars	Number	Dollars	Pounds	Dollars	Pounds	Dollars
Total	118,996	185,581	4,651	4,695	72,516	28,635	650,050	313,538

COATED OR WATERPROOFED FABRICS.

	Oilcloth (not floors)		Coated or Artificial Leather		Waterproofed Autocloth		Waterproofed Clothing	
	Sq. yards	Dollars	Sq. yards	Dollars	Sq. yards	Dollars	Sq. yards	Dollars
Total	766,719	202,343	356,059	250,121	138,311	84,954	128,452	110,338

Foreign Enterprise in the Rubber Industry

Despite Foreign Activity Much American Machinery Is Still Used Abroad — Differences in Processes

The author of this article speaks from a first hand knowledge of the rubber industry both here and abroad. Mr. Elberson has acted in a consulting and advisory capacity for many rubber manufacturers in this country and Europe. He has recently been in France working for a French syndicate modernizing a number of factories under its control. Previous articles in THE RUBBER AGE by Mr. Elberson have been well received by our readers, and we are pleased to be able to continue this valuable series. It is expected upon Mr. Elberson's return to this country that he will write additional articles on various phases of the rubber industry.

By B. W. Elberson

IT is curious to note how few of those engaged in the manufacture of rubber goods and machinery realize what the industry in general owes to foreign enterprise, not only in discovering new uses for rubber, but also in originating many labor saving devices. Abroad, wages are so much lower than here that it would seem hardly necessary for manufacturers to seek after new mechanical contrivances to keep down costs, but the very fact that nearly all foreign inventions are primarily intended for this purpose (and their ready adaption of many of our quick working machines) would indicate otherwise.

Some of Machines First Used Abroad

Noteworthy among fairly recent inventions that were in use abroad for a considerable time before "catching on" here. are: the vacuum dryer, the vertical tire vulcanizer, apparatus for building solid tires at the calender, apparatus for curing footwear in compressed air, and aluminum lasts.

Machines for building pneumatic tires appeared there about the same time as here. Of older appliances such as the "forcing machine" and spreading equipment, the former (owing to the numerous purposes to which it can be applied) is now found in nearly every rubber and reclaiming plant, the latter, however, is used in this country simply for proofing and not to take the place of the calender. Impregnating which is the usual method abroad of rubberizing tire fabric has never become an established practice here.

Some of the important articles which were first manufactured in Europe and have developed to their present state of perfection without much change in original methods (except with cord tires and air bag vulcanizing), are pneumatic and solid tires; rubber combined with asbestos to form brake lining and other articles; friction fiber discs used in auto construction; rubber heels and soles for leather shoes; also sewed on and cemented sole canvas shoes and the use of balata in belt making and for shoe soles, golf balls and dress shields.

In the manufacture of tiling and flooring they lead the way, and a number of factories abroad still produce this, and are now trying out different rubber compositions and methods of covering sidewalks and roads. The latest developments have been in the use of latex in paper making and attempts at rubber glass making.

Practically everything pertaining to the cultivation of rubber, both planting and machinery and all the experiments incidental to the early use in the factory are a credit to British and Dutch enterprise. Chemistry was first applied in Continental rubber factories and some of the coloring ingredients that are now so generally used were first tried out there, as also ore subsitutes, magnesias and talcs.

In the matter of plant and equipment in general many factories abroad have been brought very much up to date since the war, and are fully as efficient in some directions as our own. Tire fabrics they still impregnate, but now more often skim, and the calender is taking the place of the spreader more and more. Some recent changes here in the design of mills have no doubt been influenced by their continued use abroad, but we have not adopted their double gear mill drive, except where a great amount of "slip" is necessary, as in some kinds of refining and in the grinding of hard waste. No doubt a grinder with the least number of wearing parts is the strongest and will give the longest service, and also probably consume the least amount of power.

The enclosed type of mixing mill, which is getting a strong foothold here, has not as yet developed very much abroad, although for many years they have had a heavy "dough mixer" something on the order of the enclosed mixer, and also an enclosed washing mill for "scrappy" rubber. Foreign manufacturers were quick to appreciate motor drives for mill room machinery, but it was some time before they built calenders with all the small labor saving appliances which add to the efficiency of the machine. They have not, as with us, applied high speed to grinders and calenders as European manufacturers generally consider that a rapid manipulation of the rubber tends to impair the toughness and aging qualities of the product.

Foreign Adoption of American Machines

Some appliances and methods that are purely American and are finding more or less favor abroad are the rubber slicing machine, the rubber dry kiln, and the automatic mixing machine, the bias cutter, the slitting and rewinding machine, and equipment for making molded hose in long lengths. In the manufacture of golf balls their methods are the same as ours and this can also be said as regards rubber footwear, especially in the use of lastmaking, cutting and sewing machines. Abroad very few boots or ankle boots are made, as there seems to be no demand for a rubber shoe worn next to the foot, with the exceptions of rubber soled canvas shoes which are made in many different styles. Very few foreign footwear factories have adopted our method of running upper stock with a calender binding. This, however, makes a much neater appearing shoe than their hand bound shoe.

A peculiarly American custom that has never taken hold to any great extent there, as compared with here, is the devulcanization of old rubber waste for use in calender stocks, to make hose, belting, packing and footwear. Abroad waste is used principally in mold work, for which it is ground very fine but not devulcanized, and as large a quantity as possible used in the mixing. Quite a large quantity of old shoe waste is sent to this country from the Continent, as this description of serap is always in demand by American reclaimers.

Marine Rubber Market Is Possible

Large Quantities of Air Hose, Cable and Rubber Diver's Suits Would Be Required Should Reno Salvage Experiment Prove Successful

ALMOST every industry uses rubber products in one form or another. And recently rubber hose is being used by the marine salvage companies. British salvaging companies have already reclaimed about $400,000,000 in vessels, but they are only a small portion of vessels sunk, and were lying in shallow water.

The Reno Marine Salvage Corporation of New York City claims to be able to raise vessels whether they are located in shallow or deep water. The company has already purchased about 2,000 feet of four-ply rubber hose for the work it is conducting at White Stone, Long Island.* Mr. Reno, president of the organization, claims that should this endeavor prove successful his company will be in the market for substantial quantities of hose and other rubber goods.

Extent of This Field

There is a large field for this type of marine salvage work. Mr. Reno estimates that there are approximately 2,000 vessels worth raising in the English Channel and North Sea. There are also about 150 coal barges that have been sunk in Long Island Sound, while there are approximately 35 or 40 vessels lying on the bottom of the Virginian coast.

Rubber hose, the standard 2½ inch diameter type, is in great demand by such companies. On one job alone they demand between 2,000 and 3,000 feet of hose to connect the diver or marine tractor with the parent ship. In the case of the Reno Salvage Marine Corporation the hose is first of all used to connect the mother vessel with a marine tractor which is operated by two men within the tractor. Through the hose oxygen is pumped to the two men.

Then, there are a number of multiple-unit, open bottom vertical pontoons that are submerged to the depth at which the vessel lies. After these pontoons have been fastened to the vessel they are filled with air, the air being pumped through a rubber hose from the mother ship. Sufficient air must at all times be kept in the pontoons to keep them in a vertical position. The hose, therefore, must be of the highest quality and able to withstand the wave movements of the water also. The air is evenly distributed in the pontoons by means of a sea-bed siphon which is made of hard rubber compound.

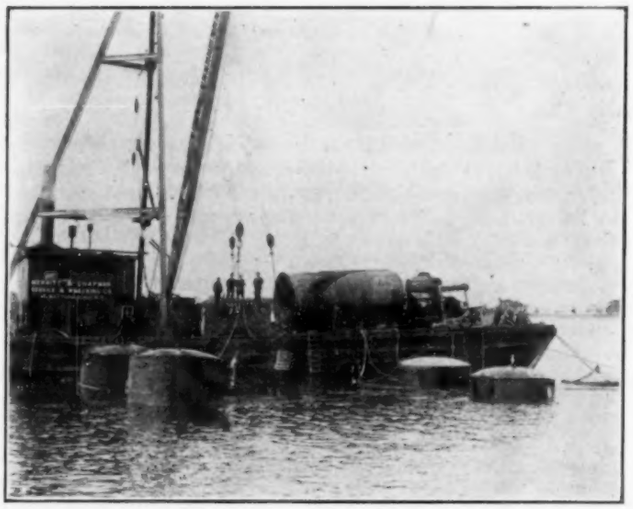
Should operations be conducted in shallow water where the sea bed is irregular, divers are used in place of the marine tractor. On an average depth of fifty or sixty feet a diver is allowed about 150 feet of hose. The diver's suit is also made of rubber, and on such jobs as the Reno Corporation undertakes, about four of five divers are needed.

Only Good Quality Hose Used

Great stress is laid upon the wearing ability and strength of the rubber hose that connects the mother ship with the diver or tractor or pontoon by marine engineers. The pontoon after it has been hooked on to the vessel is not affected by rough water, but great care must be taken to keep it filled with air so as to keep the pontoon in a vertical position.

The number of pontoons used vary with the size of the ship being raised. The use of a large number of pontoons distributes the strain to many parts of the vessel. Two sizes of pontoons are being used; one is 12 feet in diameter and 60 feet long, having a lifting capacity of 200 tons, whereas the smaller sized one is 12 feet in diameter and 30 feet long, having a lifting capacity of 100 tons.

There is also an electric cable in which large quantities of insulated wiring is used. The cable supplies electric power to a motor within the tractor. A telephone tractor also enters the tractor through the same core, for both the men in the tractor and those above the surface must be constantly communicating. To the rear of the tractor is a winding drum connected to the motor within the tractor by means of insulated wiring within a cable. Parallel cables are wound around the drum, the ends of which are attached to a float which is buoyant enough to rise to the surface.



International News Reel

View Showing Raising of the *Scully*, the American Flag Being Attached to the Funnel. Note the Large Hose Running to Pontoons.

After the ship has been raised box shaped pontoons are placed under her bottom. These pontoons also require air hose. These box-shaped pontoons supply the added buoyancy that will raise the ship's decks well above the surface.

Engineers assert that it is feasible to raise the Lusitania, the Britannic and other large vessels with the Reno pontoon system. Mr. Reno also has the honor of having invented the escalator or moving stairway. Should his system of raising vessels prove successful many million dollars of bullion, copper, brass goods, rubber and other materials which are not affected through submersion could be reclaimed. And the manufacturers of mechanical rubber goods would have another market for their wares.

*The vessel sank at White Shore was an Eagle boat, and was raised in fifty-five minutes on May 24.

Cuba Buying Canvas Shoes

The season for canvas rubber-soled footwear is now well under way, says the Rubber Division of the Department of Commerce. In January, 319,123 pairs were exported; in February, 365,126; in March, 598,928, and in April, 465,198. The principal markets in order of importance during these four months have been Argentina, Cuba, England, the Philippine Islands, and Mexico. In 1922 these five countries took 76 per cent of our exports of canvas rubber-soled footwear. Norway, Denmark, and the Netherlands were fairly good markets in 1922; the two first-named countries have purchased greater quantities during the first four months of 1923 than through the entire year 1922. During April, Newfoundland and Labrador, and British South Africa each came into the market for good sized orders. The South African business should be given careful attention.

Artificial Latex

Early Attempts to Make Artificial Latex and Some Water Dispersions of Rubber Recently Reported by Pelizzola

By Carroll C. Davis

Supervisor of Laboratories, Boston Woven Hose & Rubber Co.

IN view of the great interest aroused in natural rubber latex through the work of Kaye[1] and Hopkinson[2], which has been heightened by the announcement of Pratt and Tuttle[3] that dispersions of rubber in water have been obtained, it does not seem amiss to call attention to the recently published though less heralded work of Pelizzola at the Pirelli Laboratories at Milan.*

Attempts are by no means new to prepare artificial latex either from dry crude rubber or from its solutions, though previous to the work of Pratt and Tuttle and of Pelizzola no extensive investigations have been made. Heinzerling[4] long ago reported that crude rubber on long digestion in aqueous ammonia gave a latex-like emulsion, but such a phenomenon has not been verified. Plauson and Vielle[5], and Traun[6], succeeded in dispersing both crude and vulcanized rubber in water by aid of the colloid mill with small additions of soaps or of rubber solvents.

Luedersdorff[7] before the discovery of vulcanization obtained a paste resembling latex through the absorption of water by a solution of rubber in turpentine.

Though Alexander[8] has patented a process for obtaining water-soluble rubber by treatment of its solutions with caustic alkalies, no such product could be recovered by Pelizzola by following the directions of the patent.

Consider first the simplest case of rubber dispersed in water. It is well known that if a dilute solution of rubber in benzene is agitated with water, the two liquids are intimately mixed, but after standing a few minutes, two layers separate, a lower layer of water and an upper whitish, viscous cream which is an emulsion of water and rubber solution.

Luedersdorff's observation is therefore correct but Heinsohn[9] errs in believing that such an emulsion may be analogous in structure to that of natural latex, for natural latex consists of minute globules of rubber dispersed in a water solution of protein and other substances. In the case above, however minute globules of water are dispersed in a benzene solution of rubber. In other words, the water in this artificial emulsion is the dispersed phase, and the rubber solution is the continuous phase. This has been shown by Holmes and Cameron[10] in work on the preparation of chromatic emulsions and can be determined by any one of several methods.

Robertson's Method

One such method is that of the colored indicators due to Robertson[11]. If Sudan III, which is soluble in benzene but insoluble in water, is brought in contact with a water emulsion of benzene, the color remains confined to those droplets of benzene which are in immediate contact with it. If this test is repeated with an emulsion of water in benzene, the color rapidly spreads through the entire mass, since the benzene is the continuous phase.

Robertson's method has been criticised by many, particularly Newman[12] and Clowes[13], yet the chief results claimed by Robertson have been confirmed by Bhatnagar[14], the originator of a new method of analysis based on the unlike electrical conductance of the types of emulsions.

Aqueous solutions of caustic alkalies and dilute or concentrated ammonia act in the same manner as pure water and always constitute the disperse phase. By using in microscopical examination these basic substances, rather than coloring the rubber solution, it is possible to color the aqueous solution with an indicator, such as phenolthalein.

Rubber solutions can be emulsified in water and constitute the disperse phase, if an emulsifying agent soluble in water is added to them. All the agents that emulsify benzene or water can be used. It was found that washing soap gave the best results, starting with 1:9 solutions of rubber in benzene or benzine and adding an equal volume of 2% aqueous soap solutions. Actively agitating the two liquids forms a milky liquid which examined by any of the methods above shows minute drops of rubber solution dispersed in the soap solution. After a certain time, which can be varied between extremely wide limits, the apparent emulsion divides into two layers, a lower layer of the excess of soap solution but containing droplets of rubber from 1 to 2 microns in diameter, and an upper viscous cream constituting *the true emulsion*. Examined under the microscope this cream appears to contain globules of varying size, the majority varying from 5 to 7 microns, with others 3-4 times as large, and some about 1 micron.

Types of Emulsions

These results have been obtained simply by vigorous shaking by hand and it is obvious that in better emulsions droplets of considerably smaller size can be attained. The study of the composition of this cream is interesting. In a structure of spheres of uniform size in close contact the volume of the spheres is 74% of the total mass. From this, Ostwald[15] maintains that the chief cause determining the type of emulsion is the relative concentration of the two phases. By increasing the concentration of one phase a critical point is reached beyond which the disperse phase becomes the continuous; and *vice versa*. This theory has been criticised from the point of view that since the globules of the emulsion are not of uniform size and moreover are deformable, the ratio between the volume of the emulsion can be approximately unity. In fact Pickering[16] succeeded in emulsifying 99 parts of petroleum in 1 part of a 1% aqueous soap solution. But investigators agree [17] that emulsions are the more stable as the volume of the disperse phase approaches 74% of the total volume. Likewise from emulsions of the most varied initial composition prepared by Pelizzola creamy layers separated in which the percentage volume of the disperse phase (rubber solution) approached 74, varying from 60-80.

The velocity of separation of the cream depends upon the difference in density of the two phases, the viscosity of the continuous phase and the degree of dispersion. It is possible to obtain rubber solutions of the same density as the soap solution used, and with these to prepare stable emulsions with varying percentages of the disperse phase.

Similar to benzene solutions in water, rubber solutions in water undergo an inversion of type and are transformed into emulsions of water in rubber if they are treated with an aqueous solution of some salt of calcium, magnesium, iron, etc. This can best be studied microscopically. By allowing a tiny drop of calcium chloride solution to come in contact slowly with the emulsion, the globules of rubber solution unite to form progressively larger drops, finally forming a sort of network with the water as the disperse phase. The procedure just described is similar to that which occurs during coagulation of natural latex[17]. The similarity between

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*Note: This work of Camillo Pelizzola appears in its original form in the Giornale di Chimica Industriale ed Applicata 5, 76-77 (Feb. 1923).

Reclaimed Market Is Active

With the Price of Crude Rubber at Present Levels Reclaimed is in Large Demand by Manufacturers

FACTORIES of reclaimed rubber manufacturers are operating at about capacity. Manufacturers estimate that approximately 100,000 tons of reclaimed rubber will be sold this year. Gross sales on the average of 10 cents a pound should total in 1923 about $10,000,000.

But, the demand for reclaimed rubber depends upon the price of crude. Reclaimed men, therefore, heartily support the Stevenson Restriction Law, asserting that it is a "God Send" to them. Most reclaimers concur in the opinion that present price levels of crude rubber, selling from 27 to 30 cents a pound, is entirely satisfactory to them. At those prices they are able to meet the competition that the crude rubber market affords. Should the price of crude rubber, however, drop to 20 cents a pound, reclaimers state that there will be a falling off in their output.

Statistics, gathered by the Rubber Association of America, support their contention, for in 1919 the amount of reclaimed rubber consumed was 36 per cent as much as the crude; in 1920, when crude prices were high, the percentage touched the 40 per cent mark; in 1921 25 per cent, and in 1922, when crude sold from 12 to 15 cents a pound, 19 per cent.

One reclaimed manufacturer thinks that the Stevenson Law will be withdrawn. He said that he had information from the Far East that planters there want to restrict the plantation area. But with the Restriction Law in effect planters in British possessions fear that American manufacturers are going to develop their own crude rubber plantations, and that American efforts "are not feverish attempts to develop new sources of supply." On those grounds that manufacturer is a little pessimistic over the future outlook for the reclaimed rubber market.

On the other hand several reclaimers assert that the law of supply and demand governs the price of crude rubber. They point out that there is an ever increasing market for rubber and rubberized products. Should the supply of crude rubber be increased through American production they claim that the demand will be augmented in direct proportion to the increase in supply, and that crude rubber prices will remain around their present levels.

Uses of Reclaimed Rubber

Reclaimed rubber is constantly in demand by the mechanical rubber goods manufacturer, by rubber tape and by automobile top concerns. Reclaimed rubber is also used as a "filler", and is used in compounds for many kinds of goods, and in some instances has proved superior to the material it has supplanted.

American concerns first developed the reclaiming business. There are two processes in use at present—the alkali and acid processes. The ground scrap — such as old tires — is treated with either the acid or alkali which dissolves or eats out the fabric. These solutions must be diluted and are heated to a fairly high temperature. The reclaimed rubber, which is the residue left, is then washed, heated and dried. The American Process Company has a machine that will reclaim between 25 to 50 tons of rubber a day, compared with 8 tons a day under the old methods. Oils and other rubber substitutes are dissolved out while the ground scrap is being treated with the acid or alkali solutions. The cost to reclaim rubber varies from 3 to 15 cents a pound, depending upon the process used as well as the ingredients added.

One of the advantages that reclaimed rubber has is a reduction in labor costs in the process it has to go through in the factory, when compared with new rubber. Aside from that reclaimed rubber has other advantages. It has a certain set and hardness, and lacks some of the elasticity of new rubber. This attribute of reclaimed rubber has long been recognized by the rubber shoe manufacturer, and one of the big markets for reclaimed rubber is in rubber footwear. Crude rubber loses its shape on the last in the vulcanization process. If, however, a certain percentage of reclaimed rubber is added this defect is overcome. Some manufacturers claim that by using reclaimed rubber additional tensile strength and stiffness is added to their tire treads. These men, furthermore, claim that new rubber should only be applied to the canvas. Technologists, however, differ on this point. It is said that Goodyear and Michelin have been conducting experiments for some time along these lines.

In spite of the recent downward trend of the prices of crude rubber the United States Reclaiming Company is preparing to turn out between 8,000 and 10,000 tons of reclaimed rubber this year. Their sales, according to present indications, should total in 1923 about $1,000,000. Officials of the Philadelphia Rubber Works Company of Akron, Ohio, also report that production is again at peak figures, and it is intimated that expansion is probable. In short, so long as crude rubber prices stay above the 20 cent mark reclaimers can produce at a comfortable profit.

Artificial Latex

(Continued from Page 190)

coagulation of natural latex and the inversion of type of emulsion is still greater. In the case of natural latex the appearance of the coagulated rubber and the velocity of coagulation, apart from the coagulating agent depend upon the concentration of rubber. Coagulation takes place rapidly in latex not diluted and slowly indiluted. It is further observed that the more the latex is diluted, the greater the quantity of coagulant required to bring about good coagulation. The dilution also influences the inversion of type of the emulsions described just as it influences the coagulation of natural latex.

The more the emulsion is diluted, the greater is the distance between the particles of the disperse phase, and the greater the number of polivalent cations necessary for the inversion of the phases.

From its water emulsions, rubber can be precipitated, either by destroying the film of emulsifying agent surrounding the globules by means of the addition of acids, or by treating with a liquid in which water or benzene are equally soluble, such as alcohol. Rubber recovered from its artificial latex showed the same curing properties that it had previous to emulsification.

BIBLIOGRAPHY

1. India Rubber Journal 64, 435-42 (1922). Paper Maker & British Paper Trade Journal 62, 780 (1921).
2. U. S. Patent 1,424,020 (1922).
3. India Rubber World 67, 213-5, 291-3; 68, 488-90 (1923).
4. Weber, The Chemistry of India Rubber—London, 1912. p. 31.
5. British Patent 156,142 (1920).
6. Heinsohn, India Rubber World, December 1922.
7. Idem.
8. U. S. Patent, 844,077 (1907).
9. India Rubber World, November 1922, p. 75.
10. Journal American Chemical Society 44, 72 (1922).
11. Kolloid-Zeitung 17, 7-10 (1910).
12. Journal Physical Chemistry 18, 35 (1914).
13. Journal Physical Chemistry 20, 445 (1916).
14. Journal Chemical Society (London) 117, 542-52 (1920).
15. Kolloid-Zeitung 6, 104 (1910).
16. Journal Chemical Society (London) 91, 2001 (1917).
17. Whitby, Plantation Rubber and the Testing of Rubber. London 1920, p. 37–.

The Possibilities of Peru as a Rubber Producing Center

Forests Contain Billions of Wild Rubber Trees, While Nation Has Good Distributing Center — Water Power Abundant — Trees Yield About 10 1-2 Pounds of Rubber

THE rubber lands of Peru are situated at altitudes varying from between 500 and 2000 feet above sea level. Only insignificant portions of her great rubber producing areas are subjected to inundation. The climate is healthy, labor can be utilized all the year round, abundant foodstuffs could be cheaply produced locally, transportation offers no serious drawback, either to the Pacific or Atlantic, and the surplus coolie labor of Eastern Asia is comparatively close at hand.

The entire rubber needs of the World could be produced in that area of land lying between the Huallaga-Ucayali and Maranon rivers, the Western limit of which is only 250 miles from the Pacific, while the Eastern and Northern limits are open to ocean navigation from the Atlantic. The building of a little over 100 miles of railway would connect the area with the existing system and put it in touch with the Pacific Coast. This railroad is already planned by the Peruvian Government and construction is at present going forward.

The United States needs over 250,000 tons of crude rubber per anum. If production of this amount were to be concentrated within a given area such as described, it might pay the operators to construct their own system of transportation, which would not cost over $5,000,000.

At least twenty million acres are available in this section alone for rubber production. Thick stands of wild Hevea Braziliensis already exist, from which a certain production could be secured until they were cut down with the rest of the forest in order to permit systematic planting. Two billion trees could be planted, if necessary permitting a production of one million tons of crude rubber per annum.

Concentration of effort at such a single point would result in greatly reducing overhead charges and production costs. The proximity of the Peruvian Highlands permits a rapid change of climate that would be of great importance in regard to the health and resulting efficiency of the white staff and workers.

All fresh foodstuffs capable of production in any temperature, sub-tropic and Tropical climate, could be produced at various points along the right of way of the connecting railroad. The air route to the Pacific would be about four hours. Swift communication between various points on the area could be attained by the use of the river "sled" craft permitting speeds of thirty to fifty miles an hour.

The interest shown by important Petroleum Corporations in this and adjoining territory, indicates the possibility of very cheap fuel in the near future, an important item in plantation factory cost. Unlimited water power is also available.

Acid for coagulation could be cheaply produced locally from Citrus fruits which bear profusely in this region. Preservative chemicals are of comparatively small bulk, and could be economically imported.

The question of production per tree is a matter of the greatest interest. Will the rubber tree growing in its original home prove to yield more than the transplanted product of the Far East? It would seem reasonable to expect this. A tree tapped during a year gave over 10½ lbs. of dry rubber. The average yearly yield of Eastern plantation trees is from 1 to 2½ lbs. If Peruvian grown trees did prove to give a greater yield, it would be a double benefit, resulting in less damage to the tree in order to secure a given amount of rubber, and a great saving in the labor of gathering the latex. Crude rubber often deteriorates through extended storage under Tropical conditions both ashore and afloat. This would not occur in Peru where the product would be in a Temperate climate a few hours after leaving the hydraulic presses of the factories. Rubber could be landed in New York two weeks after leaving the point of production.

The development of the industry involving the expenditure of millions of dollars and years of time, cannot be left to either chance or experiment. Peru is the natural home of the product. Her forests already contain billions of wild rubber trees, and she has up to a few years ago contributed largely to the world's supply.

Only a well financed organization could successfully establish the industry in Peru, for local labor is practically non-existent as far as large operations are concerned.

Two important items would have to be solved before capital would be warranted in developing Peruvian rubber:—

1. Assurance of permanent supply of labor that would compare with that used in Far Eastern Rubber territory.
2. Reasonable taxation and absolute assurance of its stability.*

Important items in the American project will be that the industry should start on an absolutely modern basis both in regard to the technicalities of production and freedom from the heavy financial encumbrances that weigh heavily upon most Eastern estates.

The market for American made rubber goods extends to all countries. Peru would be an ideal distributing point for Asia, Australia and the entire South American continent.

Investigation into this possibility would disclose economic conditions conductive to its establishment on an important scale. Cotton enters into the manufacture of rubber to an extent not generally appreciated. Peru can produce every class of cotton required by the industry. Sulphur for vulcanizing can be procured from large deposits existing locally. It is safe to state that every element necessary in converting crude rubber into the manufacture of rubber goods exists in Peruvian territory.

Enumerating the fundamental facilities Peru can offer that would suggest the manufacture of rubber goods within her territory, we find:—

1. Good distributing center for points West and the southern continent.
2. Existence of expert textile workers, and intelligent class of artisan labor.
3. Cheap power, fuel oil and electricity.
4. Locally produced cotton of every description.
5. Large deposits of sulphur, and other minerals used in rubber manufacture.
6. Very healthy climate.
7. Inexpensive plant sites.

Important exerpts from the article "Peru and The British-American Rubber Conflict," by Victor H. Solaini, in the *West Coast Leader*, April 4th, 1923.

*Note:—With regard to the statement that one of the items of vital importance which would have to be definitely solved before capital would be warranted in developing Peruvian territory for rubber production, is that "Reasonable taxation and absolute assurance of its stability is necessary." In this connection the Peruvian Consul General in New York calls attention to the fact that he has been informed by President Leguia that the Government is prepared to offer every facility, and extend its full cooperation. That the Government will accord generous treatment in the question of taxation, backed with sufficient guarantees to insure its stability, is without question. This point is then only a matter of agreement to be worked out between the sponsors of the enterprise and the Government.

The Chemist and the Plant Laboratory

Today the Importance of the Chemist in a Rubber Plant is Recognized—Kind of Work He is Called to Do is Very Extensive

By Ismar Ginsberg, B.Sc., Chem. Eng.

THE chemist in industrial life has always been put in the position of justifying his existence. This is of course proper when viewed from a certain angle, as any industrial body, be it a single individual or a collection of individuals or a business organization, must fulfill an economic necessity and perform a definite service in order to exist. If the chemist does not aid in the development of an industry or exert a controlling and beneficial effect on a manufacturing enterprise, then there is no reason why he should be permitted a place in manufacturing organizations of that industry. There is no doubt that the only and surest way to build up a reputation for service, for usefulness, is for the chemist to demonstrate his abilities clearly along these lines to the manufacturer, and where his services are of no economic importance, there he should not tread, but give his attention to the numerous fields of human endeavor where he is more or less essential.

In these days of sharp competition there is need for someone to direct and control the manufacturing process, to test the materials that enter into the manufacture and those that emerge from it in the form of finished products, to work up the by-products that may be recovered into useful materials, to institute searches to improve present methods of manufacture and to devise new ones, effecting savings over the old and to investigate and solve the problems that arise from day to day. In a process wherein chemical changes take place, wherein the original material is converted from one condition to another, wherein actual physical contact with the materials of manufacture may be lost at various stages, there the chemist finds a fruitful field for his labors. The rubber industry belongs to this category and the rubber chemist is an essential member of any rubber plant organization.

Chemical and Physical Tests

While the rubber chemist may or may not be called upon to carry out the physical testing and examination of rubber and rubber goods, nevertheless he must understand the purpose and the value of physical as well as chemical tests. Both are of great importance in determining the quality of a rubber or a rubber article, and every rubber plant and large user of rubber goods, such as automobile manufacturers, etc., should have a laboratory, properly equipped for carrying out such tastes.

It is not intended to give a detailed account of the various chemical tests that are generally made on rubber and rubber products. It is not intended to describe in detail the equipment and regulation of a rubber laboratory. There are many text books, such as John B. Tuttle's recent book on The Analysis of Rubber, The Chemical Catalogue Co., New York City, which give these methods in detail, and any distributor of chemical supplies will be glad to furnish a list of apparatus and chemicals that are required for carrying out the chemical analysis of rubber and the various substances that are used in compounding it. Suffice it to say, that the chemical laboratory should contain a complete set of ordinary chemical reagents and apparatus, commonly found in any chemical laboratory in the plant, as well as complete extraction equipment for making extractions of rubber.

The greatest danger and difficulty in rubber analysis seem to be in the selection of the proper method of analysis. When a rubber manufacturer supplies his customer with rubber goods manufactured in accordance with certain definite specifications and is confident that his product is right up to the market, he is often surprised to receive a complaint from the customer that the goods were not made as requested. This is by no means an infrequent occurrence, and when the customer has a chemical laboratory or employs a chemist to make the analysis, he is generally positive that his contention is a right and just one. There are so many methods of determining the various ingredients that are mixed with rubber that it is generally absolutely essential to indicate the method used if comparable results are to be obtained by the analyst who checks up the product to see whether or not it meets specifications. It is a wise manufacturer who stipulates in the specifications that the rubber article, he furnishes, is to comply with them when the analysis is carried out in a certain definite manner.

The importance of the chemist, just as an agency for controlling the quality of the manufactured product, is thus clearly indicated. The rubber manufacturer must be sure that his product is up to the mark and the consumer that he is receiving what he ordered. The chemist must see that his analysis is carried out in the same manner as that with which his results are to be compared. It is not sufficient to make the analysis accurate, as even in the case of sulphur it is not enough to say that the sulphur content is two or four per cent. The exact method used must be stipulated. The entire question thus narrows down not to a mere analysis but to an interpretation of analytical results. It has been the experience of many rubber makers that the omission of description of analytical methods in the specifications has been the cause of considerable controversy and actual financial loss. The rubber chemist is probably aware of this fact and the chemist, who is employed in another industry and who is asked to make a rubber analysis, must remember that it it not justifiable to condemn a product just because his analysis does not give results up to specifications. He should be sure that he is using the exact method that is given in the specifications. Unless this is done, comparison is futile and inequitable.

There are many other ways in which the rubber chemist is of great value to the rubber manufacturer besides checking up the finished product. He acts to control the manufacture during its entire course. His reports will show whether the mixes have been properly proportioned, so that errors may be corrected before the rubber is vulcanized. He can also show by his tests whether vulcanization is proceeding properly, whether the proper amounts of sulphur and accelerators have been used. His reports on the semi-finished and finished products of manufacture will indicate whether or not the manufacturing processes have been carried out properly. The manufacturer needs to know what kind of rubber he is mixing in his plant, as different results will be obtained with different rubbers. Thus one rubber will give more durable products than another, while some rubbers are more elastic than others. The rubber chemist can tell by certain tests what kind of rubber is being used in the plant.

In the use of sulphur with accelerators for the vulcanization of rubber, it frequently happens that the temperature becomes high enough in the mixing and compounding processes to effect a partial vulcanization of the rubber. This is of course detrimental to the product, and such "burnt" or "scorched" rubber is of little value. In order to avoid these difficulties various oils and waxes are used. The chemist is valuable to the rubber manufacturer in this connection in that he can determine the purity of the various oils and waxes that are used for this purpose, which is an important factor in fixing their value for such purpose.

Furthermore it must be remembered that a large number of fillers and pigments can be used in compounding rubber.

Some of these substances are expensive and others are cheap. It is a natural thing that the expensive pigments, purchased on the market, should contain variable appreciable percentages of impurities and adulterants. Besides the loss in paying a high price for low-priced materials, there is the additional consideration, which must be given particular attention, namely, that in order to obtain finished rubber goods of proper qualities and of good color, only a certain kind of pigment may be used. Both the fillers and the pigments must undergo vulcanization without suffering any change. This is by no means as simple a matter as it looks. For not only must these materials withstand heat, but they must also withstand the action of sulphur at the same time that they are resisting heat. There are comparatively few colors that can hold up against such severe conditions. The chemist is of value to the rubber manufacturer in testing out pigments to see whether or not they are suitable for use in coloring rubber in the mass and to detect impurities and adulterants in high grade pigments. His work is also to analyse the various fillers that are used with rubber to see whether they come up to specifications or not and to determine if they contain any ingredients that may injure the vulcanized product or the rubber in the course of the vulcanization process.

Physical Tests

The chemist is also called upon to make various physical tests of the rubber compound and the finished product. The value of these physical tests may even be doubtful to the chemist himself, but they are really of great practical value in determining the life and quality of the finished product. It is of great importance that the chemist be able to interpret properly the results of the physical tests, so that they can be made to yield definite information regarding the essential qualities of the finished product.

The principal physical tests are: tensile strength; secondly, ultimate elongation; thirdly, set at break, and lastly, friction.

Tensile Strength of Rubber

There are various machines that are used in determining the tensile strength of rubber. The three types of machines most generally used are the Scott testing machine, Bureau of Standards type and the Schopper machine. The Scott machine is of the dead weight type, the pull being against a lever which moves outwardly as the tension is applied. The tension is read from a dial, the indicator being actuated by the movement of the lever. In the Bureau of Standards machine the pull is directed against a spring balance, which records the pull directly. The Schopper machine is also of the dead weight type. The rack, over which the lever moves, is graduated and the tension is read off opposite the point where the lever stops.

The samples are prepared in a standard way and the tensile strength is determined. This is expressed usually in pounds per square inch or in kilograms per square centimeter. The area is that of the rubber sample at rest. It must, however, be remembered that the area of the sample is considerably reduced when the breaking point is reached, as the rubber is stretched from three to nine times its original length. Hence, the breaking strength at that cross-sectional area is, therefore, considerably greater than that at the original cross-sectional area. It must also be mentioned that the tensile strength of a sample of rubber may be appreciably affected by various factors, several of which appertain to the testing machine. They have to do with the rate of separation of the jaws, temperature, size and shape of the test pieces, the direction of the cut, whether across or with the grain, previous stretching of the rubber and the age of the rubber compound. A full discussion of these factors will be found in Bureau of Standards Circular 38, Fourth Edition. The chemist must know the exact conditions under which the tensile strength test has been carried out in order to be able to make an equitable comparison of two or more rubber samples. An important consideration in the tensile strength test is the age of the rubber after vulcanization. It has been found that it is necessary to allow the vulcanized rubber to age for about three days at a maximum before making this test in order to obtain an idea of the maximum strength of the rubber. During that time the rubber comes to an equilibrium.

Ultimate Elongation

This is defined to be the extent to which a rubber sample can be stretched before rupture takes place. The ultimate elongation of a vulcanized rubber article, provided the vulcanization has been carried out properly and thoroughly, is a direct indication of the amount of rubber that is contained in that article, for it is only affected by the percentage and grade of the rubber in the compound. The same factors, mentioned above, also have a bearing on the tensile strength test, and are potent in affecting the elongation test.

Set at Break

The set at break is determined by laying the test pieces aside for a period which varies from one to 24 hours. After they have been removed from the testing machine the increase in the distance between marks is measured. This is then calculated to percentage. The set at break for various cures of the same compound passes through a maximum which corresponds to the best method of vulcanizing the rubber compound. A curve can be plotted against the time of cure by using the values obtained by this method. The set at break has not been used for any important practical purposes, but the set, that is noticed, when the rubber sample is not subjected to elongation, equivalent to ultimate elongation, is used more extensively. The usual proceedure in making the test is to subject the rubber sample to the stretching load for a period of ten minutes and then release the load and measure the set after another period of ten minutes.

Friction

The fourth test is the friction test. This refers to the tendency that the rubber has to adhere to fabric. It is an important test for it will tell how strong the union between the rubber and fabric is in a built-up product like a tire or rubber hose. There are two methods of determining the friction. One is to find the amount of separation under a definite load, and the other to find the load that is required to separate the rubber and fabric at a given rate of speed. The first method is used in the testing of mechanical rubber goods, as for example, rubber belting. It must be remembered that this test does not give the degree of the true adhesion between the rubber and the fabric but only a minimum value of the same. The second method gives the maximum strength of the adhesion, and it also shows whether there is any irregularity in the adhesive force holding the rubber and fabric together over the area tested. This method can be used in testing the adhesion that exists in the acid cured splice of an inner tube and between the various layers of a tire. It may also be used to determine the adhesive force holding together a piece of soft rubber, joined to a piece of hard rubber.

The chemist may also be called upon to tell how well a certain compound will stand up under conditions of wear. It is obviously impractical to wait until the rubber article has secured the desired wear, but a means must be adopted of inducing artificial wear in the rubber. In other words, the rubber is artificially aged. This is generally done by subjecting the rubber to a constant temperature of 70 degrees C. Tests are made, then, at frequent intervals until deterioration sets in. The heating takes place in air which is a disadvantage, inasmuch as both the oxygen of the air and the temperature play a part in the deterioration process. It is better to conduct the heating in an inert gas or in an atmosphere, free from oxygen and other gases detrimental to rubber.

Besides the analytical duties of the chemist, he is also called upon to institute researches and experiments on new processes and new materials. Of recent years the technology of rubber manufacture has become more complicated and detailed with the advent of acceleration of vulcanization, vulcanization in the cold, use of latex direct in rubber manufacturing processes, manufacture of flaked rubber direct from latex without the use of coagulants, etc. The chemistry of the rubber making processes has become more involved, and has become better understood due to the introduction of the principles of colloid chemistry. All this has made the chemist of greater value to the rubber manuafcturer than he has ever been before. For the new processes and the new information that has been rendered available on the chemistry of rubber and rubber vulcanization require chemists for their proper interpretation and understanding, and for their application in a practical manner in plant practice.

Activities in Foreign Rubber Markets

Opportunities for all Classes of Manufactured Rubber Goods Exist in all Parts of the World — U. S. Leads in Nearly all Lines

THE exports of rubber products from the United States during March of this year totaled $4,316,176, United States custom officials report. This is the highest point reached since the close of the boom period in 1920. The exports during March, 1922, totaled $3,524,785, March being the record month during that calendar year. While there have been domestic price increases, resulting from higher raw material and labor costs, price increases, except in a few minor instances, have not been applied to export sales.

American rubber concerns have been paying close attention to the foreign market, and their vigilance is being reflected in the constantly expanding volume of manufactured rubber articles being exported. In the nine months, ended March, 1923, the United States exports of rubber products were valued at $27,274,663, against $21,785,696 in the corresponding period of 1922.

The following table epitomizes the volume of rubber products exported by quarters for 1922, 1923 and for the month of March, 1923.

VOLUME OF UNITED STATES EXPORTS OF RUBBER PRODUCTS

	1922				1923	
Articles.	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	First quarter.	March.
Rubber boots ...pairs	42,190	62,790	77,672	59,277	68,488	20,990
Rubber shoes ...do	155,473	147,643	271,585	288,858	134,215	57,942
Canvas rubber-soled shoes .....pairs	495,260	979,211	747,996	755,160	1,283,177	598,928
Druggists' rubber sundries .....pounds	207,957	209,021	161,032	217,773	230,401	85,896
Rubber jars and accessories .....pounds	75,148	109,327	88,506	152,868	112,477	29,544
Automobile casings .....number	304,844	356,020	333,619	331,737	448,234	190,468
Automobile tubes do	190,206	239,564	274,099	232,850	295,965	134,141
Solid tires for autos .....do	11,253	13,954	12,512	17,946	26,516	10,576
Rubber belting pounds	461,545	488,106	691,915	943,768	861,402	333,479
Rubber hose ...do	647,979	922,716	853,043	956,972	1,161,720	467,846
Rubber packing .do	227,161	261,399	317,373	343,513	302,547	115,327
Rubber soles and heels .....do	236,925	418,033	480,467	598,961	487,644	199,720
Rubber thread .do	244,702	262,964	254,717	301,184	203,221	79,788

Market for Tires

The foreign market for American made tires varies according to the country and racial sentiments of the people. Consequently, the following is a brief synopsis of trade conditions and the demand for American made casings in the foreign field. In 1922 exports of tires ranked 27, totaling $19,899,000.

Haiti: A reduction in tire prices early in January was followed by a recent slight rise in prices. The dealers there sometimes allow a customer discounts. American made tires completely control this market, although Michelin is also represented there. The Michelin 31 x 4 cord retails at $20.00 and the 32 x 4 straight side cord at $30.00.

Hankow, China: The American Consul General in Hankow states that there are 222 passenger automobiles in Hankow, 75 per cent of these being American makes. There are also 32 motorcycles and several thousand rickshaws with rubber tires. Hankow cannot boast of more than 25 miles of good roads. The further development of the automotive and tire industry there depends on the construction of suitable highways. Old tires are bought up and sent to Shanghai for mending or remanufacture, there being no vulcanizing machinery used in that city.

San Salvador: The following information regarding the landing of tires is reported by Consul Lynn W. Franklin. Ocean freight per cubic foot (U. S. Curreney) $0.79; Consular fees paid in New York, 2 per cent; other New York expenses including maritime insurance, 2 per cent; duty per kilo $0.30 with recharge on duties 25 per cent of duty, plus 5 per cent of duties; freight La Libertad to San Salvador $0.30 per 100 pounds; brokerage and litherage at La Libertad 3 per cent of New York cost.

Oporto, Portugal: Michelin, Dunlop, and Englebert are the leaders in sales in this city, Michelin having by far the largest sales. Two American makes and the French Goodrich are also on the market.

Florence, Italy: Michelin gets about 65 per cent of the tire trade in that city, Pirelli, 20 per cent, and Dunlop and two American firms divide the remaining 15 per cent. American tires are highly regarded by automobilists, although they are somewhat more expensive on account of adverse exchange rates, transportation charges, etc.

France: No changes in tire prices have occurred in France since December 22, 1922, but a ten per cent increase is expected.

Austria: On April 25 a tire reduction of 10 per cent on tubes and 20 per cent on casings was instituted by Michelin in Vienna.

Italy: Michelin is said to be shipping to England from its Italian factory, total Italian exports to England during the last nine months totaling 1,966.8 metric tons.

Panama: No metric-sized tires are used in Panama. American makes of tires are without competition. Dealers have considerable stocks of tires on hand.

Barbados: Practically all automobile tires used in Barbados are of American makes. Total number of passenger cars is about 1,000, 50 trucks and 50 motorcycles. Each truck requires about four tires a year. Three repair shops do vulcanizing and retreading for which American equipment is used.

United Kingdom: Tire dealers customarily grant discounts to owners of commercial vehicles and taxis, the discount on tires for commercial purposes being 5 per cent; to owners of 3 motor trucks 10 per cent. Discount on tires for taxis is 10 per cent and 15 per cent for 3 or more taxis. All told there has been no alteration in tire prices since last October. It, however, appears that new price lists will be issued in May by leading manufacturers, general opinion being that an increase in prices will be made.

Spain: Personal survey of this market should be made before attempting to open branches or secure dealer accounts by the exporter. Personal reconnaissance will give an unsurpassed idea of the correct means of merchandizing tires, avoiding mis-conceptions, and secure the vital information that cannot be secured by mail or second hand. According to Fred C. Slater, Corunna, Spain, American tires hold first, third and fifth places in that city. The usual dealer discount is 20 per cent, but the leading American make gives 25 per cent. The Consul also states that American makes enjoy a favorable reputation in that district.

India: The present time is said to be favorable for entering the India market, providing favorable representation can be obtained. The large trade balance in India's favor during the past half year together with a very favorable agricultural season is helping to bring Indian business out of its depression of 1921 and 1922. Prospects for the future are gradually improving.

Esthonia: Demand for tires in Esthonia is necessarily small during the winter season, and the depleted stocks are not replenished until spring, when the demand improves. It is said that an American distribution station in Denmark would aid in increasing tire sales in Esthonia. Orders are generally placed in Germany or in England.

Indo-China: Personal survey of the territory needed.

Syria, Beirut: Market is flooded with tires and tubes of all descriptions. Estimated that about 2,412 tires are consumed in the busiest month of the year, July. Competition by Michelin has had a marked effect upon the sale of Amer-

ican makes. French company practically controls this market, because of its superior marketing organization.

Palestine: Importation of American made cars has increased the demand for American tires, Vice-Consul George C. Cobb states. Michelin holds third place in this market.

Morocco: Michelin is the most popular tire there. Michelin allows a trade discount of 10 per cent on every 20,000 franc contract, and a further 4 per cent discount on every contract of 50,000 francs and an additional 1 per cent in excess of this amount.

Canary Islands: All tire dealers in this market are retailers, Vice-Consul Raymond Phelan states. It is the custom to allow a discount of 5 pesetas on any tire sold to a chauffeur. American tires enjoy a good sale here. Michelin and Continental hold second and third places.

Japan: Exports for tires decreased from 1,171,000 yen in 1922 to 989,000 yen for the same period for the first three months in 1923. Imports of crude rubber have also fallen off.

Venezuela: American tires hold leading positions in this country, Dunlop and Michelin being close rivals.

Cuba: The French Michelin is the only tire on sale in Cienfuegas outside of American makes. List prices except for Ford sizes are subject to 10 per cent discounts, except for one American concern which lists net prices.

Mauritius: Over 2,000 motor vehicles were registered in Mauritius in 1922, according to unofficial reports. All of the leading tire dealers are located in Port Louis, a town of 43,000.

Holland: Since Michelin cut prices 15 per cent in January the company is getting 100 francs more on a medium-sized tire sold in florins in Holland than the same article in Belgium. Dunlop and Peters Union have both met Michelin's prices. Michelin has made price reductions in most high exchange countries.

Bombay, India: American tire manufacturers have difficulty in meeting competition in this market from the United Kingdom and Continental countries. Total tire imports for the year ended March 31, 1922 were 53,013, 20,600 of which were received from the United Kingdom, 12,063 from France, 7,997 from United States and 6,490 from Italy. Tires imported are distributed by branches and agencies.

Ceylon: Dunlop, Michelin and one American make are contending on about equal terms for first position in the tire market in Ceylon.

Sumtra East Coast: Fabric tires are not kept in stock. Michelin, Dunlop and Continental are the leading competitors in this market. Improvement in the crude rubber market is leading to a greater tire sale.

Java: American made tires have excellent future in Java. They hold third, fifth, sixth and seventh places. Dunlop, Michelin and Continental, however, control the market. Any discount to secure business is given to dealers.

Siam: No tire market there. Roads are very poor. Interurban connection is mostly by water.

Kenya Colony: Improving business conditions give a brighter outlook for tire sales. Two American makes are popular. Michelin and Dunlop are practically the only other makes sold. No price changes have occurred during the past three months, but a 10 per cent reduction is expected.

Australia: Future for American tire makes excellent in this market. U. S. Rubber Co., Fisk, Goodrich, Goodyear and Pennsylvania are represented in this market. All tires are sold on the consignment basis. Four Australian concerns are manufacturing tires, turning out about 8,250 tires a week. Heavy demand for cord tires in Adelaide. Only one Australian concern, Perdriau, offers a complete line of cord tires.

Madagascar: Market is controled by Dunlop, Michelin, Palmer, Persan and Integral.

Danzig: Continental tires are best known in this market, but do not stand up with American makes. Prices of American tires compare favorably with German make.

Poland: Poland has one tire factory, organized 2 years ago under the name of Pneumatyk. The factory in Posen is manufacturing only metric sized solid tires. Company is negotiating with Polish Government for a loan, but acting Commercial Attache, H. B. Smith, Warsaw, states that possibility of securing loan at this time are not good.

Norway: American makes dominate the tire market in Northern Norway. Five American and five foreign makes are on sale.

Switzerland: The outlook for sale of American tires is good because quality and recent low prices have been a good advertisement for them. The low prices of American makes are viewed with alarm by agents handling European tires, vice Consul William H. Mathee, Zurich, states. There has been a downward tendency in prices, believed to be temporary, however, caused by European makes endeavor to capture Spring market.

Bicycle Tires

Our principal markets for bicycle tires are Mexico, Cuba, the Philippine Islands, the West Indies and certain parts of South America. Single tubes predominate the Cuban, Mexican and West Indian markets. Other foreign markets prefer the double-tube tire, popular on account of the service it renders. Official statistics of the number of bicycles in use in foreign countries are incomplete. In 1921 there were about 4,307,089 bicycles registered in France and 2,051,104 in Japan. The number in use in other markets are as follows:

Country.	Number	Country.	Number
United Kingdom	4,000,000	Australia	100,000
Germany	2,000,000	Canada	100,000
Netherlands	1,000,000	China	200,000
Belgium	500,000	Dutch East Indies	100,000
Denmark	500,000	British South Africa	70,000
Switzerland	400,000	Argentina	40,000
Italy	125,000	Brazil	30,000
British India	200,000		

In order of importance, Germany, The United Kingdom, France, Japan, The United States and Italy are the important bicycle tire producing countries, although Holland, Belgium, Austria and Denmark produce large quantities for local consumption.

Boot and Shoe Market

The United States and Canada are said to supply about 60 per cent of the rubber footwear imported into the United Kingdom. It is estimated that 100,996 dozen pairs of rubber boots and shoes were imported during the first ten months of 1922, and should be divided into the following percentages: Canvas rubber-soled shoes, 80 per cent; rubber and artics, 13 per cent; rubber boots, 7 per cent. The value of the rubber foot wear imported is placed at £202,608.

Wales: Light rubbers are not worn in this district to the extent that they are in the United States. The climate is damp and wet underfoot a considerable part of the time, and this condition is met by the use of shoes and boots with soles perhaps twice as thick as those of the usual American shoes, upon which are placed thick plates of rubber as an added protection, Rubbers as they are now made would not fit over the average English boot or shoe, nor, in view of the sturdy construction of the latter, are they necessary. The short life of a pair of rubbers, considering the continuous use they would have in this district, would make them an item of too much expense to be worn practically daily as would be necessary in this climate. A great many varieties of soft rubber plates, cut to different shapes, are sold here and fastened on by shoemakers or the wearer himself, which has the effect of elevating the shoe a quarter of an inch or more from the wet pavement, and it is thought that American companies might manufacture these with a view to competing with the British product. A soft rubber disc also is worn on the heel, screwed on, and sells for a few pence, being more economical than the regulation live rubber heel, that requires more accurate fitting. A great many working men, and children have iron plates on their shoes to prolong the life of the sole and heel.

British dealers would welcome receipt of correspondence with American manufacturers. It is not improbable that companies might receive some direct business should they make their products known to local dealers.

Prince Edward Island, Canada: The population of the entire province of Prince Edward Island is but 88,000, and the Province buys around $150,000 worth of rubber boots

and shoes annually. The market seems to be well supplied with good quality rubber boots and shoes manufactured by two large Canadian concerns who have local agents here, and who on account of the tariff of 25 per cent and the 6 per cent sales tax based on import value, have an advantage over American competitors handling the same grade of articles. I have been reliably informed that only a relatively small quantity of American rubber boots and shoes are sold here, and that there is a demand only for those of exceptional merit, the cheaper grades not competing profitably with the canadian stock. Owing to the high tariff there is believed to be little prospect of competing successfully with Canadian manufacturers. Perhaps the best means to do a wholesale business would be to appoint a Halifax, N. S. or St. Johns, N. B. firm as general selling agents for the Maritime Provinces, which comprise the Provinces of Nova Scotia, New Brunswick, and Prince Edward Island. The two cities named are the largest in the Maritime Provinces. Unless an American firm is prepared to undersell Canadian manufacturers, local dealers see little prospect for direct business with retailers.

Ontario, Canada: American Consul G. R. Taggert reports that there is a potential market for high grade rubber boots. A number of fishing craft operate from ports in that district situated on Lakes Erie and Huron.

Prior to the war practically all the rubber boots and shoes used in Newfoundland came from the United States and Canada, but as Canadian exchange depreciated, the United States gradually dropped out of the market. About a year ago, a Scottish firm sent a representative to Newfoundland, and despite high freight rates they are now quoting a rubber under Canadian prices. Dealers who have handled their product during the past year state they have had no complaints concerning its wearing qualities. Two United States concerns are making a determined effort to increase their trade in long rubber boots, especially hip boots, in which one Canadian firm is doing an excellent business. Retailers in St. Johns were of the opinion that it would hardly be possible for Canada to compete with the United States in rubber-soled canvas shoes, as only a very small number of the cheaper grade are imported.

Brazil: Rubber overshoes are very little worn and are not manufactured in Sao Paulo, American Consul, E. M. Lawton, reports. Tennis shoes and sport shoes are manufactured in that city.

Azores Islands:No rubber footwear was exported from the United States to the Azores during 1922. The use of rubber footwear is precluded by the nature of the soil, which is of volcanic origin and is exceedingly gritty.

Persia: The Persian market for rubbers was formerly supplied chiefly from Russia by the Treugolnik and Prowodnik. Samples of men's rubbers resemble those customarily worn in the United States. The heel is about three-eighths of an inch thick, and there is a slight projection in the back to assist in removal. Rubbers for Persian women are unusually flat, with very little allowance for the instep and with no built-up heel; in other words, they are adapted for wear with flat-soled slippers.

Finland: Suomen Gummitehdas O/Y (Finska Gummifabriks A/B) has recently completed a new factory for the manufacture of rubber overshoes. The production capacity is 4,000 pairs per day, while the old factory produced 2,000 pairs daily. The company expects to be able to satisfy the demands of the entire country by fall. The former limited production has prevented exportation, and considerable quantities have even been imported, chiefly from Germany and Sweden. The imported shoes have sold at a lower price than the Finnish product, but the latter has enjoyed a good market on account of durability and good quality.

Trade Conditions and Export Figures

The year 1922 in foreign trade had been preceded by two boom years, 1919 and 1920. The outlook for 1923 is exceedingly bright. An important factor in the world trade situation during 1922 was the rise in the British pound sterling from an average of $4.16 in December, 1921, to $4.61 in December, 1922, or from 85.4 per cent to 94.7 per cent of parity. During the year the Canadian exchange rose above par, as did the Swiss franc, Dutch guilder, Swedish krona, and Cuban pesos. In South America, the Argentine and Chilean pesos improved considerably. The improvement in foreign exchanges enabled the foreign buyer to pay dollar prices more comfortably and more cheerfully. This, therefore, is one factor in the decided upward trend of our exports during the last quarter of 1922 and the first quarter of 1923.

During March of the current year American manufacturers exported 598,928 pairs of canvas shoes with rubber soles, valued at $449,472, compared with 238,134 pairs in March, 1922, valued at $193,208. American concerns exported 57,942 pairs of shoes, valued at $47,675, chief purchasers being Norway, Mexico, Cuba and the South American countries. This compares with 50,733 pairs exported during March, 1922, valued at $44,956. In March, 1923, there were 85,896 pounds of druggists' rubber sundries exported, valued at $75,611, which is slightly below the exports of March, 1922. Rubber belting exported during March, 1923,, totaled 333,497 pounds, valued at $168,411, against 174,803 pounds, 1922, valued at $83,345. Rubber packing totaled 115,327 pounds in March of this year, valued at $59,934, against 105,833 pounds for the corresponding month in 1922, valued at $50,119. Rubber soles and heels also showed a substantial increase over March of 1922, the exports for March of this year being 199,720 pounds, valued at $68,806. All told March of this year showed substantial increases over the same month in 1922.

There have been very few changes in the relative rank of the rubber manufacturers' best customers. The Philippines, for example, is still a 100 per cent American market, taking about 5 per cent of the rubber goods exported from this country during 1922. Cuba, Norway and the South American Countries are also heavy purchasers.

Pecularities of natives also have much to do with developing foreign markets. For example, certain of the natives in British India will not use skins of animals in any form of wearing apparel. As a result a British concern is now manufacturing a rubber soled sandal, made of vegetable fibre with cotton strapping and a sole of smoked sheet rubber. Catering to the idiosyncrasies of local purchasers also has a great deal to do with improving trade conditions in their respective territory.

German Rubber Industry During Last Quarter of 1922

The difficulties met with in obtaining new working capital made it necessary by the heavy increase in costs of raw materials that have to be purchased abroad, have multiplied to such an extent that a number of factories were unable to cover their requirements, resulting in a reduction of working hours and also the dismissal of employees. Business was not uniform and the amount of work on hand has decreased considerably. Selling possibilities have become limited as a consequence of the greatly increased prices. Exports have fallen off — sometimes the German prices were too high, at others the customs tarriffs of countries producing the commodities themselves prevented trade. The scale of wages played an important part in the increase of prices.

The B. Polack Gummiwarenfabrik, of Waltershausen, announce a dividend of 50 per cent on its 1921-22 working year, against 15 per cent dividend and 10 per cent bonus for the preceding year. The capital will be increased to 30,000,000 marks. The Offenbacher Gummiwerke Carl Stoeckicht, Offenbach, is increasing its capital by 20,500,000 marks ordinary and 500,000 marks preference shares.

Plantation and Crude Rubber Notes

Ceylon: A maximum of 36,020 tons of Ceylon-produced rubber may be exported from the island during the year ending October 31, 1923, according to an announcement by the Rubber Controller for Ceylon. The amount is well below shipments for the past four years, exports in 1922 totaling 46,694 tons; 39,341 tons in 1921; 39,532 tons in 1920 and 46,081 tons in 1919. The rubber restriction scheme, Marshall M. Vance, American Consul, Colombo, avers, is primarily for the purpose of lowering production and exports.

About one-half the rubber production of South India is sold on auction in Colombo, and 2,282 tons of an estimated production of 5,000 tons were so sold in 1922. It is further believed that under restriction exports from Ceylon for 1923

will probably exceed those of the calendar year 1922. This belief is based on the following statistics:

Exports permitted under restriction for year ending October 31, 1923	36,020 tons
Possible exports of unrestricted stocks on hand October 31, 1922	11,000 tons
Total	47,020 tons
South India Rubber exported through Ceylon, calender year 1922	2,282 tons

British Malaya: The 14th annual report of the Council of the Rubber Growers' Association (Inc.), of London, shows the following statistics covering 515 companies and 6 trust companies operating under the association in the Far East:

Companies operating in—	Authorized capital.	Issued capital.	Acreage owned	Rubber acreage planted or interplanted.
Malaya (288)	£46,701,364	£38,256,594	968,042	664,871
Ceylon (98)	19,091,079	15,834,772	388,730	145,096
Sumatra (42)	17,566,900	11,540,579	535,145	192,133
Java (38)	8,019,500	6,717,398	373,309	102,514
Dutch miscellaneous (2)	265,300	229,543	33,294	4,930
India (15)	2,244,000	2,103,027	73,548	36,898
Burma (8)	840,150	636,328	18,259	13,486
Borneo (21)	3,366,940	2,668,373	158,971	38,018
Other countries (3)	156,850	139,136	12,544	4,072
Total	98,252,083	78,125,750	2,561,842	1,202,018
Trust companies (6)	2,812,441	1,477,773	.....	.....
Grand total	101,064,524	79,603,523	.....	.....

The particulars of the acreage of 9 private estates are included in the above figures.

Exports from Medan

Crude rubber exports from Sumatra to the United States, as shown by the Medan consular returns, totaled 6,729,607 pounds in December, 1922, as compared with 5,385,178 and 7,030,986 in October and November. This includes rubber shipped in latex form, according to its dry weight.

Bolivian Rubber Trade Reviving

There is considerable optimism in Bolivia over the possible revival in the rubber industry. Rising prices of rubber are reported to be the chief factor in this revival.

Brazilian Trade in Rubber for 1922

Brazilian exports for rubber showed an ascending movement in 1922, and after having been on the decline for a long time the increase is very gratifying, although the figures given are still below those for previous years except 1921. Exports of rubber for 1922 were 19,855 tons; 1921, 17,429 tons; 1920, 23,531 tons; 1919, 33,252 tons; and 1913, 36,232 tons.

Miscellaneous Markets

Rubber Hose: The market in St. Johns, Canada, for rubber hose is a very small one. The American manufacturers supply most of the dealers in St. Johns, with hose and belting.

Rubber Gloves: The use of rubber gloves in Cuba by surgeons and physicians is almost as general as in the United States. With the exception of the larger hospitals, practically all users of surgical rubber gloves buy them from the local drug stores. Small quantitites of rubber gloves are imported from Germany, the great bulk, however, being imported from the United States. No rubber gloves are manufactured in Cuba.

Philippines: In 1922 the Filipinos purchased 99 per cent of their mechanical rubber goods from the United States, as well as 100 per cent of their rubber belting from American concerns. The Philippines is a 100 per cent American market.

United Kingdom: During 1920 the United Kingdom imported 3,441 rubber-proof overcoats, mackintoshes, and the like, valued at £6,130, while in 1921, 5,143 were imported, valued at £6,737. The imports for the first 10 months of 1922 are combined with imports of "overcoats and mackintoshes made waterproof with oil paint and other proofing, as well as rubber," the total being 14,400 garments valued at £6,037. The imports of garments proofed with oil, etc., in 1920 numbered 5,061 valued at £7,044, and in 1921, 31,447 valued at £7,985. The sources of imports for waterproofed clothing are available only for 1920, in which year the United States supplied 22 per cent of the rubber-proofed garments and 75 per cent of the oil-proofed garments.

France: France imported during 1922 belting, hose, washers, etc., valued at 20,308,000 francs. Other rubber products, outside of tires, rubber footwear, elastic webbing goods and waterproof clothing were valued at 3,831,000 francs. Waterproofed clothing totaled 1,487,000; elastic webbing goods, 2,144,000 francs; rubber thread, 9,641,000 francs.

Czechoslovakia: Imports of Hose and tubing, 685 metric quintals; rubber coated and impregnated piece goods, 461; toys of soft rubber, 376; elastic goods, 228; clothing made of waterproofed and elastic goods, 328; press cloths and other technical articles, 253; card cloths for carding factories, 252; hard rubber goods, 323; articles of patent sheets, 175; rubber thread, 113; rubber belting, 100.

New Goodrich Airplane Tire

An interesting streamlined airplane tire has just been developed by the B. F. Goodrich Rubber Co., of Akron, Ohio. The Goodrich company has assiduously followed a program of aircraft accessory development in its department of aeronauties and it considers its new "skirted" airplane tire with streamline disk attachment a signal advancement in airplane tire designing.

The skirt of this new tire is a loose rubber-covered fabric flap vulcanized to the side-walls of the tire. The edge of the skirt is grommeted to receive the lacings which hold the wind-shield disk in position. This disk is so designed as to compensate automatically for uneven lacings or localized stretching and keep it smoothly taut at all times.

The reduction of air resistance on landing gears equipped with these new tires is noticeable, Goodrich engineers assert. Streamlined airplane tires have long been considered essential to the most efficient performance of airplanes. By bringing the disk out to the side wall of the tire and making it even with the tire at its widest part, the Goodrich airplane tire overcomes the "pocketing" tendency of other styles where the disk is hooked over the rim.

MARKETS

Cottons and Fabrics

NEW YORK, June 3, 1923

The most important event of the two weeks past was the report of the Department of Agriculture showing the condition of the new crop as of May 25. This first cotton report of the season indicated that the crop was 71 per cent of normal, compared with 69.6 a year ago, 66 in 1921 and 73.6 the average May 25 condition for the last ten years.

Usually an estimate of the acreage planted is made with the condition report but this year the acreage will not be officially estimated until July 2 when the June 25 canvas will be announced. It has been noted that in previous years there has been considerable abandonment of acreage during the period from May 25 to June 25. The area under cultivation at the end of June, 1922, according to the revised report made by the census bureau, was 34,016,000 acres and the area picked was 33,036,000 acres with an average of 141.3 pounds to the acre.

The May 25 condition by states was as follows:

Virginia, 79; North Carolina, 77; South Carolina, 64; Georgia, 65; Florida, 87; Alabama, 70; Mississippi, 70; Louisiana, 68; Texas, 77; Arkansas, 66; Tennessee, 70; Missouri, 54; Oklahoma, 63; California, 93; Arizona, 92; all other states, 90.

The monthly condition of the cotton crop for the years 1914 to 1923 follows:

	May 25	June 25	July 25	Aug. 25	Sept. 25
1923	71.0	...	...	...	...
1922	69.6	71.2	70.8	57.0	50.0
1921	66.0	69.2	64.7	49.3	42.2
1920	62.4	70.7	74.1	67.5	59.1
1919	75.6	70.0	67.1	61.4	54.4
1918	82.3	85.8	73.6	55.7	54.4
1917	69.5	70.3	70.3	67.8	60.4
1916	77.5	81.1	72.3	61.2	56.3
1915	80.0	80.2	75.4	60.2	60.8
1914	74.3	79.6	76.4	78.0	78.5

Cotton Market Goes Lower on Report

The fact that condition figures were slightly better than expected brought about a sudden and drastic reaction in cotton prices and the selling pressure continued until the end of the day with prices off $6 to $7 a bale. Cotton prices as on the day of the report, June 1, on the New York Cotton Exchange follow:

	Open.	High.	Low.	Close.	Prev. Day.
July	27.00	27.04	25.93	25.95@26.00	27.12
Oct.	24.56	24.57	23.25	23.26@23.32	24.63
Dec.	24.05	24.05	22.85	22.85@22.90	24.14
Jan.	23.71	23.73	22.60	22.65@22.70	23.80

A 2,000,000 Bale Error

The Department of Agriculture which was severely scored for its estimate of the new crop with figures based on what the southern planter "intended" to do, again has caused excitement in the trade by its revised figures of the carry-over of world cotton followed by a statement of the chief of the cotton division that there had been an error of 2,000,000 bales in the department estimate. On April 21 the estimated carry-over was put at 6,800,000 bales. The revised announcemnt states that if the world consumption of cotton continues at the same rate as for the eight months ended March 31 there would be a world supply of all kinds of cotton amounting to only 4,369,500 bales on August 1. Figures issued by the Department show that the world's supply of cotton on August 1, 1922, amounted to 9,536,000 bales and on August 1, 1921, 14,752,000 bales.

Reduction in Mill Operations

There was a reduction in mill operations during May but in most cases particularly with the southern mills, it was a discontinuance of overtime, and the mills may still be said to be running about normal. American mills consumed during the first four months of the present year 2,377,800 bales as compared with an average of 1,974,161 for the same months in the period of five years from 1917 to 1922. During the same period in 1914 consumption amounted to 1,965,530 bales.

Supply and Distribution

The supply and distribution of American cotton, during the present cotton year up to April 30, with a comparison with the corresponding period in the two preceding cotton years, figured in bales, was as follows:

	1923.	1922.	1921.
On hand July 31 prev. yr.	2,831,553	6,534,360	3,563,162
Crops	9,729,048	7,977,778	13,270,970
Imports	357,896	327,896	262,242
Total	12,918,497	14,840,034	17,036,874
Dom'tic cons. Aug. 1-Ap. 30	5,040,004	4,447,262	3,579,899
	7,878,493	10,392,772	13,456,475
Exports Aug. 1-Apr. 30	4,287,051	4,881,215	1,187,187
Indicated supply Apr. 30	3,591,442	5,508,557	9,269,288

(Continued on Page 202)

EXTRA STAPLE COTTON

There was more interest in the extra staple cotton market than has been shown for some months, although the interest was largely in inquiries. The mills raised their bids for cotton but even then there was difficulty in bringing about trade. Medium grade Sak for shipment was quoted around 33 to 34 cents and uppers around 32 cents for shipment. On spot uppers were quoted at 31 cents and Sak was 33 cents. Pimas continue to sell near the high prices reached several months ago. Number ones are quoted at 38 cents, Number twos at 36½ to 37½ cents and Number threes at 36 cents. New Mitafifi was offered at 30 cents and strict middling Tangris ranged from 31 to 32 cents. The following are late quotations on strict middling classed as to staple on a very high standard:

1 1/8	inch,	31	to 32½	cents
1 3/16	inch,	33½	to 34	cents
1 1/4	inch,	35	to 36½	cents
1 5/16	inch,	37½	to 39	cents

TIRE FABRICS

Tire manufacturers are keeping stocks low until the inventory period is over which will be about July 1 and the fabric mills are holding to a minimum of stock until the tire producers indicate their plans for the future. In the meantime fabric prices have eased off. Carded peeler cord ranges from 60 to 63 cents and this price might be shaded on a substantial order.

CORD FABRICS			
Combed Sakellarides	.75	@	.80
Combed Peeler lb.	.65	@	.68
Carded Peeler lb.	.60	@	.63
Combed Egyptian uppers lb.	.67½	@	.72½
Carded Egyptian uppers lb.	.62½	@	.65
SQUARE WOVEN			
17¼-ounce Egyptian uppers, combed lb.	.65	@	.70
17¼-ounce Egyptian uppers, carded lb.	.60	@	.62
17¼-ounce Sakellarides, combed lb.	.72	@	.78
17¼-ounce Peeler, combed lb.	.63	@	.67
17¼-ounce Peeler, carded lb.	.58	@	.60

SHEETINGS—The market was weak and the only business noted was for small lots at price concessions. 13½ cents net was quoted on 40 inch, 3.60 yard and 11½ cents net for 40 inch, 3.75 yard.

DUCKS—Single filling duck was in better demand and sales were reported on the basis of 22 cents. Double filling was quoted at 24 cents, card basis. Shoe duck quotations ranged between 50 and 54 cents. Very little trading was done in any department of the market.

BURLAPS—Local trading in burlaps was quiet. Heavies were dormant and light weight advanced slightly in a dull market.

SHEETINGS			
40-inch 2.50-yard yd.	.17¼	@	—
40-inch 2.85-yard yd.	.14⅝	@	—
40-inch 3.15-yard yd.	.16	@	—
40-inch 3.60-yard yd.	.13½	@	—
40-inch 3.75-yard yd.	.11½	@	—
40-inch 4.25-yard yd.	.10	@	—
DUCKS			
Belting lb.	.44	@	.45
Hose lb.	.44	@	.45
Enameling lb.	.50	@	.52
Shoe Ducks lb.	.53	@	.55
Single filling lb.	.22	@	.23
Double filling lb.	.23½	@	.25
BURLAPS (Carload Lots)			
7½-ounce 40-inch	5.30	@	5.35
8 -ounce 40-inch	5.35	@	5.40
10 -ounce 40-inch	7.05	@	7.10
10½-ounce 40-inch	7.10	@	7.15
DRILLS			
37-inch 3.25-yard yd.	.13½	@	—
37-inch 2.75-yard yd.	.15½	@	—
37-inch 3.00-yard yd.	.14½	@	—
37-inch 3.50-yard yd.	.12½	@	—
37-inch 3.95-yard yd.	.11¼	@	—
OSNABURGS			
30-inch 7-ounce	.17	@	—
40-inch 7-ounce	.17¾	@	.18

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, June 3, 1923—The market during the last period seemed to be ahead of the calendar and the dullness and inactivity that prevailed in most quarters was suggestive of the summer months rather than May. The slowing down was in the spot market but there were no price changes of any importance and values in general were steady. Contract withdrawals continued in the same heavy volume as during March and April. The Oxides, Barytes and Carbon Black were pillars of strength in the market and production of these materials is hardly able to keep pace with the demand from the rubber makers and other industries. Following the holiday there was more inquiry and the market seemed ready to take on increased activity during June. Makers did not seem to be concerned over the unseasonable dullness.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90 @	.95
Aniline oil, drums	lb.	.16½ @	.17
Diphenylguanidine	lb.	1.20 @	—
Excellerex,	ton	17.00 @	—
Formaldehyde-Aniline	lb.	.52½ @	—
Hexamethylene-tetramine	lb.	.90 @	.95
Paraphenylenediamine	lb.	1.55 @	1.60
Thiocarbanilide, kegs	lb.	.27 @	.30
Vulcocene	lb.	.35 @	—

Inorganic

Lead, sublimed blue	lb.	.09¼ @	—
Lead, white	lb.	.09¼ @	—
Litharge, domestic	lb.	10.90 @	11.74
imported	lb.	.17 @	—
Lime, Superfine	lb.	.02 @	.02½
Magnesia, calcined, light,	lb.	.23 @	.24
extra light	lb.	.45 @	—
heavy	lb.	.05 @	.06
Orange Mineral	lb.	14.40 @	14.50

COLORS

Blacks

Carbon Black	lb.	.16 @	.20
Micronex		.17 @	.21
Lamp Black	lb.	.12 @	.40
Bone "	lb.	.05½ @	.07½
Drop "	lb.	.07½ @	.10
Ivory "	lb.	.15 @	.45

Blues

Prussian	lb.	.55 @	.60
Ultramarine	lb.	.15 @	.35
Cobalt	lb.	.31 @	.36

Browns

Iron oxide	lb.	.03¾ @	.06
Sienna, Italian,	lb.	.06 @	.08¾
Umber, Turkey,	lb.	.03¾ @	.04½
Vandyke, domestic	lb.	.03½ @	.04

Greens

Chrome, light	lb.	.32 @	.34
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12 @	—

Reds

Antimony crimson, 15/17% F.S.	lb.	.34 @	.44
sulphur free	lb.	.39 @	.50
golden, 15/17% F.S.	lb.	.32 @	—
calcium and sulphur free	lb.	.40 @	—
red sulphuret 15/17% F.S.	lb.	.19½ @	—
Indian, English,	lb.	.08 @	.12
Para toner	cwt.	1.00 @	1.10
Toluidine toner	lb.	2.10 @	2.25
Venetian red	lb.	.03½ @	.06
Vermillion, quicksilver, English	lb.	1.30 @	1.35
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.07 @	.07½
Aluminum bronze	lb.	.55 @	.60
Azolith	lb.	.07 @	.07½
Lithopone, domestic (factory)	lb.	.07 @	.07½
Zinc Oxide—American Process			
American Horse Head special	lb.	.08½ @	.09
XX red	lb.	.08 @	.08½
American Azo:			
ZZZ (lead free)	lb.	.08 @	.08½
ZZ (under 5 per cent leaded)	lb.	.07¼ @	.07¾
Z (8-10 per cent leaded)	lb.	.07¼ @	.07¾
Zinc Oxide—French Process			
White seal	lb.	.12 @	.12¼
Green seal	lb.	.10¾ @	.11¼
Red seal	lb.	.09¾ @	.10¼

Yellows

Chrome, light		.20 @	.21
dark and medium	lb.	.20 @	.21
Cadmium Sulphide	lb.	1.50 @	1.75
Ocher, French	lb.	.02¾ @	.03½
domestic	lb.	.01½ @	.03

COMPOUNDING INGREDIENTS

Aluminum flake	ton	22.50 @	—
hydrate light	lb.	.19 @	.21
Ammonia carbonate,	lb.	.09 @	.10½
Barium carbonate,	ton	75.00 @	80.00
Barium Dust	lb.	.05 @	—
Barytes southern off-color,	ton	15.00 @	20.00
Western, prime white	ton	28.00 @	—
Basofor	lb.	.04¾ @	—
Blanc fixe, dry f.o.b. works	lb.	.04 @	.04¼
Carrara filler	lb.	.01½ @	.02
Chalk, precipitated, extra light	lb.	.04¼ @	.05
heavy	lb.	.03¼ @	.04
Clay, China, domestic,	ton	15.00 @	16.50
Dixie	ton	22.00 @	32.00
Blue Ridge	ton	20.00 @	30.00
Fossil flour	ton	60.00 @	—
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.20 @	.26
cabinet	lb.	.18 @	.30
cabinet low grade	lb.	.16 @	.19
common bone	lb.	.08½ @	.14
Graphite flake, bbls.	lb.	.05 @	.06
amorphous	lb.	.05 @	—
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Liquid latex	gal.	1.30 @	—
Mica, powdered	lb.	.15 @	—
Rotton Stone (powdered)	lb.	.02½ @	.04½
Soapstone, powdered	ton	12.00 @	15.00
Starch, powdered	cwt.	2.80 @	2.90
Talc, domestic	ton	15.00 @	18.00
French	ton	20.00 @	—
French, high grade	ton	40.00 @	—
Italian	ton	47.00 @	58.00
Terra Alba	cwt.	1.85 @	2.00
Tripoli, white	lb.	.02 @	.02½
Whiting, commercial	cwt.	1.00 @	1.25
Quaker	ton	13.00 @	15.00
English, cliffstone	cwt.	1.50 @	2.00
gilder's bolted	cwt.	1.10 @	1.25
Paris white American	cwt.	1.25 @	1.50
Wood pulp XXX	ton	— @	—
" " X	ton	— @	—
Zinc Oxide— 5 per cent leaded		.07¼ @	.07¾
10 per cent lead sulphate	lb.	.07¼ @	.07¾
20 per cent lead sulphate	lb.	.07¼ @	.07¾
35 per cent lead sulphate	lb.	.07¼ @	.07¾

(Also see whites)

MINERAL RUBBER

Genasco (factory)	ton	.50 @	.52
Hard hydrocarbon	ton	33.00 @	42.00
Soft hydrocarbon	ton	30.00 @	38.00
Pioneer M.R.	ton	42.00 @	44.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00 @	50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	40.00 @	45.00
Synpro, granulated, M. R. (factory)	ton	55.00 @	65.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	3.38 @	3.63
Cresylic, 97 p.c.	gal.	1.25 @	1.30
95 p. c.	lb.	1.20 @	1.25
Muriatic, 20 degrees	cwt.	1.00 @	1.10
Nitric, 36 degrees	cwt.	4.50 @	5.00
Sulphuric, 60 degrees	ton	9.50 @	12.00
66 degrees	ton	15.00 @	16.00
Tartaric, crystals	lb.	.37½ @	—

Alkalies

Caustic soda, 76 p.c.	cwt.	3.26 @	3.75
Soda ash, 58 p.c.	cwt.	1.95 @	2.30

Oils

Castor, No. 3, bbls.	lb.	.14 @	.15
Corn, crude, bbls.	lb.	.12½ @	.12¼
refined	lb.	.13 @	—
Chinawood, bbls.	lb.	.25 @	.30
Cottonseed,		.09¾ @	.12½
Glycerine, drums	lb.	.18½ @	.19
Linseed, domestic	gal.	1.09 @	1.14
imported	gal.	1.10 @	1.15
Palm Niger	lb.	.07¼ @	.08
Lagos	lb.	.07½ @	.08
Peanut,domestic,crude	lb.	.15 @	—
Pine, steam distilled	gal.	.75 @	.80
Rapeseed, refined	gal.	.84 @	.85
blown	gal.	1.00 @	1.05
Rosin, first rectified	gal.	.46 @	—
second rectified	gal.	.48 @	—
Tar, commercial	gal.	.31½ @	—
Soya Bean		.12½ @	.12¾
Petrolatum, standard	lb.	.05 @	.08
dark amber	lb.	.03½ @	—

Resins and Pitches

Cumar resin, hard	lb.	.09 @	.10
soft	lb.	.09 @	.10
Tar Retort	bbl.	12.50 @	—
kiln burned	bbl.	13.50 @	—
Pitch, Burgundy	lb.	.05 @	.06
coal tar	lb.	.01½ @	—
pine tar	lb.	.03 @	—
Rosin, grade K	bbl.	6.00 @	—
Shellac, fine orange	lb.	.90 @	—

Solvents

Acetone, drums	lb.	.21 @	—
Alcohol, denatured, No. 1 bbls.	gal.	.42 @	.47
Benzol, 90 per cent	gal.	.27 @	.33
pure	gal.	.30 @	.35
Carbon bisulphide,	lb.	.06 @	.06¾
Tetrachloride	lb.	.09 @	.10½
Dimethylaniline	lb.	.42 @	.43
Motor gasoline, steel bbls.	gal.	.21½ @	—
Naptha, V. M. & P.	gal.	.20½ @	—
Toluol, pure	gal.	.30 @	.35
Turpentine, spirits	gal.	1.20 @	—
wood	gal.	1.00 @	—

Waxes

Beeswax	lb.	.30 @	.42
Carnauba, No. 1	lb.	.42 @	.43
Ceresin, white	lb.	.10 @	.11
Bayberry	lb.	.25 @	.28
Montan, crude	lb.	.04½ @	.05
Ozokerite, black	lb.	.23 @	.24
green	lb.	.27 @	.28
Paraffine	lb.	.02¾ @	.05
Sweet wax	lb.	.10 @	.12

SUBSTITUTES

Black	lb.	.09½ @	.13
White	lb.	.10 @	.16
Brown	lb.	.10 @	.15
Brown factice	lb.	.08 @	.16
White factice	lb.	.09½ @	.16

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.21 @	.38
Sulphur chloride (jugs)	lb.	.18½ @	.15
" " (drums)	lb.	.05 @	.06
Sulphur flour (bbls.)	cwt.	2.75 @	3.30
(bags)	cwt.	2.00 @	2.40
Commercial		1.35 @	1.70
Superfine		2.00 @	2.40
Sulphur, 100 per cent pure,		— @	—
Bergenp't brand (bags)	cwt.	2.50 @	2.80
(bbls.)	cwt.	2.70 @	3.05

Chemical Notes

Zinc Oxide—There was big business in this market and the demand from the tire makers for this oxide was the best the trade has ever experienced. Prices remain unchanged, French process, red seal, bags, being quoted at 9¾ cents a pound; barrels, carlots, 10 cents and less than carlots, 10¼ cents; white seal, barrels, carlots, 12 cents; less than carlots 12½ cents; green seal, bags, 10¾ cents; barrels, carlots, 11 cents; less than carlots, 11¼ cents. American process, commercially lead free, bags, 8 cents.

Barytes — Record breaking business prevails in this market and producers have been busy supplying the rubber and other industries. Prices remain unchanged with prime Western quoted at $28 a ton, f.o.b. works and southern off color $15 to $20 a ton.

Soda Ash—There was a better spot demand and increased deliveries on contract during the period but no advance in prices by leading producers. Light in bags continues to be offered at 1.95 to 2.30 per 100 pounds, ex store.

Caustic Soda — The demand has been good and the movement during the month of May was in excess of April. Contract withdrawals continued heavy but the spot market during the two weeks was inactive.

Aniline Oil—Only a limited amount of business was done but quotations remained firm at 16 cents per pound for carlots and 17 cents for smaller quantities.

Dimethylaniline—The market was slow with consumers taking small quantities. The price remained at 42 to 43 cents per pound in drums and 41 cents in tanks.

Talc — There has been an unusually good demand for both domestic and imported talc this season. Consumption continues very heavy. No price changes were reported and domestic is quoted at $15 to $18 a ton; French, $20; high grade French, $40 and Italian, $47 to $58.

Whiting—This market was steady with the demand well up to the season and prices remained unchanged. Commercial continues at $1 per hundred pounds; American paris white, $1.15; English cliffstone, $1.50.

Orange Mineral—The market was quiet but steady and prices remained unchanged. The range for domestic was from 14.40 cents to 15.50 cents a pound. English was quoted at 15.50 cents and French, 17 cents.

Litharge—Consumption contines heavy with a good demand coming from the rubber industry. There was no price changes and casks continues to be quoted at 10.90 cents a pound; 100 to 500 pound kegs, 14.50 cents; 500 to 2000 pounds, 13.05 cents and 2,000 to 10,000 pounds, 12.52 cents.

Lithopone — Considerable Belgian material continues to come into the market, most of which goes direct to consumers, and such quantities as is offered bring the same price as domestic. All the leading producers are sold up ahead and find their greatest difficulty in keeping up deliveries. Domestic in bags is quoted at 7 cents a pound; in barrels, carlots, 7 to 7¼ cents a pound; in barrels, less than carlots, 7¼ to 7½ cents a pound.

Scrap Rubber

NEW YORK, June 3, 1923

There was some factory buying in the scrap rubber market during the past ten days, and as a result the market had a firmer tone. Dealers state that reclaimers are still operating at capacity, and that there should be a substantial upswing in prices shortly. Dealers also state that they have considerable quantities of scrap rubber on hand. As stated in this column in our last issue considerable improvement in the prices of scrap rubber is anticipated.

There was some buying of mixed auto at between $12 and $14 a ton, which is a rise of 2 points during the past 10 days. Inner red tubes mounted fractionally, quoted .03½ to .04 cents a pound. Other quotations showed practically no fluctuations throughout.

Prices quoted at this date are:

Auto tire peelings	.01	@	.01¼
Standard White auto ton	20.00	@	25.00
Mixed auto ton	12.00	@	14.00
Bicycle tires ton	7.00	@	8.00
Clean solid truck tires	.01¼	@	.01½
Boots and shoes	.03	@	.03¼
Arctics, trimmed	.01¾	@	.02
Arctics, untrimmed	.01⅛	@	.01⅝
Inner tubes, No. 1	.04½	@	.05
Inner tubes, compounded	.03¼	@	.03½
Inner tubes, red	.03½	@	.04
Battery jars, clean hard rubber	.02	@	.02½
Rubber Hose	.00¾	@	.00⅞
Red packing	.01	@	.01¼
White druggist sundries	.04	@	—

Reclaimed Rubber

NEW YORK, JUNE 3, 1923

The reclaimed rubber market remained quiet and steady throughout the past fortnight. Factories are still operating at capacity. Reclaimers, however, state that on account of the large quantities of scrap rubber on the market they have practically named their prices to scrap dealers. This in a way accounts for the fact that there has been no change in the prices of reclaimed rubber.

Quotations of this date are:

Standard Reclaims			
Floating Tube	.17	@	.18
Friction	.24	@	.25
Boots and Shoes	.11½	@	.12
Boots and Shoes (washed)	.13¾	@	.14¼
Mechanical	.10	@	.11
Hose	.10	@	.11
Tires, truck	.09	@	.09½
Tires, auto	.10	@	.10½
White	.13½	@	.14

Crude Rubber

NEW YORK, JUNE 3, 1923

The crude rubber market during the past two weeks has shown considerable strength, ribbed smoked sheets now being quoted at around 29 cents. This recent advance is said by some to be a marking up process on the part of holders of rubber who feel that consumers must soon come into the market to replenish dwindling supplies. Dealers state that manufacturers are still following a hand to mouth buying policy, although some of the larger concerns have been doing some buying in the Singapore market.

Dealers, however, are confident that there will continue to be a gradual increase in the price of crude rubber. They base this assertion upon the fact that there has been very little buying up to the present and that manufacturers are not covered beyond June and July. Consequently, dealers expect to see the price of crude rubber go beyond the 30 cent level.

During May of this year about 34,575 tons of crude rubber were imported, compared with 22,095 tons during the same month of 1922. However, with a more rigid enforcement of the Restriction law exports of crude rubber should be considerably less.

Throughout the past two weeks prices of the lower grades have remained firm and steady.

Quotations of this date are as follows:

Plantations			
Ribbed Smoked Sheets	.29	@	.29¼
First Latex, spot	.29⅛	@	.29½
June	.29	@	.29¼
July, December	.30⅝	@	.30⅞
Amber Crepe No. 1, spot	.28½	@	.29¼
Amber Crepe No. 2, spot	.27¾	@	.28
Amber Crepe No. 3, spot	.26¼	@	.26¾
Light Clean Thin Brown Crepe	.28¼	@	.28½
Commercially Clean Thin Brown Crepe	.27¼	@	.27½
Specky Brown Crepe	.26¾	@	.27
Roll Brown Crepe, spot	.26¾	@	.27
Paras			
Madeira Fine	.30	@	.30½
Acre Fine	.29	@	.29½
Up-river Fine	.28¾	@	.29
Up-river Medium	.28¼	@	.28½
Up-river Caucho Ball (shipment)	.27	@	.27½
Up-river Coarse	.26	@	.26¼
Islands Fine	.26	@	.26¼
Islands Medium	.24½	@	—
Islands Coarse	.13	@	—
Cameta	.13	@	—
Xingu Ball	.26	@	.26¼
Tapajos Fine	.28	@	.28¼
Tapajos Medium	.25	@	—
Pontianac			
Prime Pressed	.13	@	.14
Plantation	.07½	@	—
Bangermassin	.08	@	—
Siak Gutta Percha	.20¾	@	—
Prime Macassar	3.00	@	—
Balata			
Surinam Sheets	.80	@	.85
Columbia Block	.60	@	.65
Venezuela Block	.70	@	.75

COTTON EXPORTS FROM ALEXANDRIA

Alexandria, April 27, 1923

	Receipts Alexandria Cantars	Exports in Bales to England	Continent	America	Total Exports Cantars	Stock Alexandria Cantars
This week	59,909	6,447	6,921	3,067	126,448	1,723,819
Same week 1922	40,154	5,628	7,478	852	105,934	2,195,380
" " 1921	86,611	4,287	2,425	2	51,383	1,854,747
Since 9/1/1922	6,392,636	351,662	244,791	195,415	6,000,817	—
Same time 1921	4,725,164	254,307	170,772	148,238	4,364,784	—
" " 1920	3,810,193	157,865	111,620	38,363	2,353,648	—

American Rubber Patents

GRANTED MAY 15, 1923

1,454,885 Rubber Sole. George Ferguson, Wollaston, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,454,933 Garter. David C. Lash, Shirley, Mass.

1,454,995 Collapsible Tire Core. Harold A. Denmire, Akron, Ohio, assignor of one-half to The General Tire & Rubber Co., Akron Ohio.

1,455,038 Inner Tube. Howard F. Bledsoe, Ellensburg, Wash.

1,455,039 Method of Molding Plastic Structures and Apparatus for Use in Same. George A. Bonelli, Kingman, Ariz.

1,455,080 Dust Cap for Tire Valves. Clyde R. Croson and Jacob W. Kindelberger, Wheeling, W. Va.

1,455,118 Auxiliary Tire Carrier. Julius C. Manock, Angiola, Calif.

1,455,119 Securing Means for Spare Tires. Julius C. Manock, Angiola, Calif.

1,455,140 Rubber Footwear. Theodore E. LaFayette, Alfred A. Glidden and John J. Gaughan, Watertown, Mass., assignors to Hood Rubber Co., Watertown, Mass.

1,455,146 Signal Device for Tire Valves. Albert Nelson, Wheaton, Minn.

1,455,180 Resilient Wheel. Sotorious D. Warner, Kokomo, Ind.

1,455,189 Resilient Wheel. Benjamin F. Crum, Oakland, Calif.

1,455,218 Tire Mold. Robert Mitchell Merriman, Akron, Ohio.

1,455,236 Automobile Spring Tire. James R. Tucker and Eugene M. Ayers, Baltimore, Md.

1,455,240 Hollow Article of Rubber or Like Material and Process and Apparatus for Making Same. Henry Z. Cobb, New York, N. Y., assignor to The Mechanical Rubber Co., A Corporation of New Jersey.

1,455,260 Tire Manufacture. Thomas Midgley, Springfield, Mass., assignor to Fisk Rubber Co., Chicopee Falls, Mass., a Corporation of Mass.

1,455,359 Hose. Ernest Schulthess, South Orange, N. J.

1,455,361 Solid Elastic Tire for Road Vehicles. John F. Sipe, New York, N. Y.

1,455,364 Method of Manufacturing Inner Tubes. Ralph E. Stephenson, Indianapolis, Ind., assignor to G. & J. Tire Co., a Corporation of Indiana.

1,455,412 Armored Pneumatic Tire. Charles Scheuner, Chicago, Ill.

1,455,453 Cushion Wheel for Moor Vehicles. Burns Lyman Smith, Syracuse, N. Y.

1,455,481 Split Demountable Rim. Hugh E. Geiver, Wessington, S. Dak.

1,455,517 Resilient Wheel. Arnold Jucum Arnoldson, Elsinor, Utah.

1,455,535 Ventilated Waterproof Shoe. Leone Lazzari, Greenville, N. J.

1,455,544 Rubber or Rubber Coated Article. Louis Minton, Manchester, England.

1,455,584 Tire Pump. Howard Graham, Knippa, Tex.

1,455,615 Automobile Tire. Eugene L. Hodge, Far Rockaway, N. Y.

1,455,730 Demountable Rim. Oscar L. Ingram, Walla Walla, Wash.

1,455,733 Demountable Rim. John G. Reed, Orwingsburg, Pa.

1,455,734 Inner Tube for Automobile Tires. William E. Roberts, Little Falls, N. Y., assignor to Paramount Rubber Consolidated, Inc., Philadelphia, Pa., a Corporation of Delaware.

1,455,744 Insulating Tape. Harry I. Diamond, Atlanta, Ga.

GRANTED MAY 22, 1923

1,455,775 Leakproof Inner Tube. Grover C. Berryman, Los Angeles, Calif.

1,455,844 Vehicle Wheel. John Lang, Philadelphia, Pa., assignor of one-half to Frank Peer, Philadelphia, Pa.

1,455,855 Pneumatic Tire Casing. Herbert F. Andrich, Detroit, Mich.

1,455,857 Sectional Rim. Amos Bennett, Chesapeake, Ohio, and James H. Hatchett, Huntington, W. Va.

1,455,889 Automobile Tube. John Schwab, Winnipeg, Manitoba, Canada.

1,455,891 Attachment for Valve Insides. Maximilian Charles Schweinert, New York, N. Y.

1,455,888 Garter, Louis J. Scheinman, New York, N. Y., assignor to Governform Corp., New York, N. Y.

1,455,893 Unvulcanized Rubber Composition. Frank Webb Stockton, Pittsburgh, Pa., assignor to Aluminum Seal Co., New Kensington, Pa.

1,455,962 Leak Detector for Tire Tubes. Herbert M. Matthews, Worton, Md.

1,455,963 Lithopone and Method of Manufacture. Walter F. Meister, Collinsville, Ill.

1,455,997 Spring Rim. Peter Eisenbach, Detroit, Mich.

1,456,062 Pneumatic Tire. Edward Brice Killen, London, England.

Cotton Markets

(Continued from Page 199)

Looking on the Bright Side

Homer L. Randin, Vice President of the New Orleans Cotton Exchange, in a recent address, said that practically 50 per cent of American cotton during the past five years went abroad, whereas during the five ante-war years we sent to foreign spinners about 62 per cent. He figured that we exported during the past five years 29,693,000 bales of a total production of 59,658,000 bales and then in a fine burst of optimism he stated: "That in a short time the South may again produce 16,000,000 to 17,000,000 bale cotton crops and that we may yet supply the world with 20,000,000 to 25,000,000 bale crops, for all of which there will be a good and sufficient demand at remunerative prices, is, I believe, beyond question; but to do this we must be free of legislative shackles. We must be free to do business on the basis of equity and fair dealing as between country and country, between merchant and merchant."

Looking on the Dark Side

And there was another voice from the south during the period we are reviewing, a voice that was not so hopeful; of the present at least. "The world is facing an acute cotton famine," declared J. S. Wanamaker, president of the American Cotton Association. "It is conceded by the most reputable authorities that it will be necessary for the American mills to go on short time on September 10 and the foreign mills on October 1. The acreage abandonment will be the greatest on record, due to shortage of labor. Less than 1,000,000 bales of cotton will be outside the consuming establishments on August 1, and if the law of supply and demand had been permitted to function middling cotton would be selling at 50 cents per pound today." And then he suggested that cotton be bought by individuals and corporations all over the south and held for one, two or three years until the price reached 50 cents a pound; a price level necessary to hold labor in the fields.

New Incorporations

COLORADO

The United Rubber Company, Inc. $50,000. Principal office, Denver, Colorado. Incorporators: C. H. Wildin, J. H. McGee and M. D. Heineman.

DELAWARE

Van Devere Corporation, to deal in rubber tooth brushes. $100,000. Delaware agent, American Guarantee and Trust Co., 1600 Delaware avenue, Wilmington, Delaware. Incorporators: M. M. De Van, C. A. De Vere, F. B. Kraus—Philadelphia, Pennsylvania.

ILLINOIS

M. & L. Rubber Co., to manufacture and deal in rubber tires and rubber goods. $20,000. Principal office, 3025 Indiana avenue, Chicago, Illinois. Incorporators: A. B. Legnard, W. M. Legnard, A. E. MacGregor. Correspondent, McGilvray, Rames, Vaughan and Tilley, Title & Trust Bldg., Chicago, Illinois.

INDIANA

The Inter-Continental Tire and Rubber Company. Capital, 200,000 shares, no par value. Principal office, Indianapolis, Indiana. Incorporators: J. D. Wiggins, S. T. Davis, Herbert W. Lantz, Parke G. Haynes and Otto J. Feucht.

MASSACHUSETTS

Montello Stay Company, Inc., to deal in leather, rubber and substitutes. Principal office, Brockton, Massachusetts. $25,000. Incorporators: Charles M. Cornelis, William H. Emery and James M. Murdock—all of Brockton, Massachusetts.

The Best-Ford Tire & Rubber Co., to deal in rubber and automobile goods. $600,000. Principal office, Millbury, Massachusetts. Incorporators: Ralph W. Baldwin, Worcester, Mass.; T. Joseph Morressey, East Walpole, Mass.; George E. Bradley, Upton, Mass.

NEW YORK

Darcoid Co., to manufacture packing and rubber goods. Active capital, $27,000; 1,000 shares of common stock, no par value. Incorporators: J. C. Sneath and M. V. Walsh Attorney, C. S. Hayes, 151 Nassau street, New York City.

J. M. Sacks Co., to manufacture rubber footwear. $100,000. Incorporators: J. M. Sacks, C. M. Sacks and B. Von Klein. Attorneys, Otterbourg, Steindlers and Houston, 200 5th Ave., New York City.

OHIO

Harveys Rubber & Supply Co. $500. Principal office, Cleveland, Ohio. Incorporators: Harvey G. Heise and John H. Smart.

Colonial Tire Sales Co., to deal in tires and tubes. $5,000. Principal office, Canton, Ohio. Incorporators: K. A. Feist, J. Glaser, T. H. Leaby, F. Drukenbrod and C. O. Weintraul.

The Star Diamond Co., to manufacture tires and other rubber products. 1000 shares, no par value. Principal office, Kent, Ohio. Incorporators: O. Wilcox, G. W. Cable, S. B. Berk and R. Dennison.

TEXAS

Letterman Rubber Works. $30,000. Principal office, San Antonio, Texas. Incorporators: J. H. Letterman, J. T. Meyers and M. W. Letterman.

WEST VIRGINIA

Virginian Tire and Rubber Company. $300,000. Principal office, St Albans, West Virginia. Incorporators: G. C. Hendrick, P. Thurman, Tracy Maynor, Selden Trump and E. L. Ellison—all of Beckley, West Virginia.

Dissolution

The State Tire and Rubber Company of Indianapolis, Indiana, filed preliminary certificate of dissolution.

1,456,066 Resilient Vehicle Wheel. George H. Lantz, Omaha, Neb.

1,456,075 Automatic Puncture-Closing Device for Pneumatic Tires. Michell Resk, New York, N. Y.

1,456,078 Tube and Tire Repair Material. Albert E. Stephenson, Dallas, Tex.

1,456,109 Rubber Tire Forming Roller. Robert McClenathen, Cuyahoga Falls, Ohio, assignor to Kelly Springfield Tire Co.

1,456,115 Patch for Pneumatic Tires. Julius I. Berg, Berg, N. Dak.

1,456,163 Tire. Hugh B. Walton, Deer Park, Wash.

1,456,168 Pneumatic Life Raft. Charles C. Witmer and Beckwith Havens, Hammondsport, N. Y., assignors to "Airships Incorporated," Hammondsport, N. Y., a Corporation of New York.

1,456,202 Tire. Thomas E. Ware, Little Rock, Ark., assignor of one-sixth to James K. Riffel, one-sixth to Frank H. Dodge, one-sixth to James M. Stewart, and one-half to Elva Ware, all of Little Rock, Ark.

1,456,245 Dust Cap. Edward B. Mang, Los Angeles, Calif.

1,456,357 Valv Pad for Inner Tubes and Process of Making Same. Joseph A. Bowerman, Wilbraham, Mass., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,456,375 Automatic Boltless Rim. Andrew Forsman, Iron River, Mich., assignor of one-half to Archie Beauchamp and Emil Beauchamp, one-tenth to Hector McPhee, and one-tenth to Edward Greenwood, all of Iron Country, Mich., and one-twentieth to A. E. Stuht, Iron River, Mich.

1,546,403 Process of Repairing or Closing Punctures in Pneumatic Tires and Plug for that Purpose. William C. Ranney, Elbridge, N. Y.

1,456,421 Tire Armor. Lawrence C. Bonifacino and Matilda B. Irby, Baltimore, Md.

1,456,425 Machine for Forming Pneumatic Tires. Barthold de Mattia, Clifton, N. J.

1,456,426 Core and Chuck. Peter de Mattia and Barthold de Mattia, Clifton, N. J.

1,456,444 Air Valve for Inner Tubes. Steven Holick, Millsboro, Pa.

1,456,484 Tool for Applying and Removing Tire Chains. LeRoy D. Falconer, Bethel, Kans., assignor to Edward F. Stephens, Kansas City, Mo.